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ST. LOUIS WELCOMES THE 1954 CONFERENCE

Delegates representing professional and lay organizations in 25 states discuss progress, current problems and future areas of attack in the battle against blindness.

REPORTS on scientific and educational techniques that are currently being employed in the battle against blindness were the subject of discussion at the National Society's 1954 Annual Conference held in St. Louis, March 10–12. Medical advances, sight restoration and improvement, interprofessional relationships, special education of children with impaired vision, progress in industry—these and other problems were discussed by experts in the various fields. At the conference headquarters in the Hotel Jefferson lively debate and much good fellowship prevailed among the delegates, representing professional and lay organizations in 25 states.

The Missouri Committee of NSPB was the official host of the conference and was largely responsible for its success. The excellent work that this committee is doing to further vision conservation in the state was reflected in its efficient planning for the event and the warm hospitality enjoyed by all who attended. Deep appreciation is hereby expressed to Mrs. H. Rommel Hildreth, chairman; Rey Eilers, vice-chairman; Dr. T. E. Sanders, and the other committee members who gave able assistance.

Are we winning the battle or losing it? National Society President Mason H. Bigelow in his opening address to the conference recalled that the Society had met in St. Louis just 25 years ago and observed that since then depression, strife and the tiny atom have shaped our lives anew. Yet through all those years—since 1908, in fact—the campaign against eye disease, injury and neglect has been waged relentlessly. Thanks to the active front line fighters and the many thousands who are giving support we are moving forward. But so is our enemy. Despite our gains and advances 27,000 Americans will become blind in 1954. Moreover, we must face squarely that three quarters of a million Americans now living will be overtaken by blindness before they die.

Great gains have been made against ophthalmia neonatorum, trachoma, syphilitic conditions and accidental injuries; but the lengthening life span has opened up new areas of attack. It is estimated that one million persons are now slowly losing their vision from glaucoma. Retrolental fibroplasia, the disease that attacks small premature babies, now occupies the place vacated by ophthalmia neonatorum as the major cause of blindness among the

very young. Eye accidents still occur by the hundreds of thousands in industry, in the home and elsewhere.

Future Field of Action

"Clearly," said Mr. Bigelow, "we have only just begun to fight against blindness. We must work diligently to see that sight-saving knowledge now available is generally applied. Through research we must seek more knowledge and then see that it, too, is generally applied.

"The field for action is as broad as the imagination itself. It encompasses such activities as the vision screening research project recently completed here in St. Louis. It encompasses efforts on behalf of the partially seeing in the classroom. It encompasses the Wise Owl pin worn proudly on the lapel of an industrial worker who cheated blindness by being prepared against accidents. The idea of the Wise Owl eye safety incentive program originated in a plant right here in St. Louis, just eight years ago.

"The field for action must be made to include every thinking person in America, and it is to the public that we must look for support for the major struggles which lie ahead. It is obvious that there must be far more research into the causes of the eye diseases if we are ever to achieve victory. It is equally obvious that this will cost money, and it is money that we Americans, in our own enlightened self-interest, must be willing to spend.

"Today, our investment in eye research is pitifully small. Counting all the funds being made available by government appropriation and by voluntary contribution, we Americans are investing for eye disease research but one penny per person per year.

"My answer to the question, 'How goes the battle against blindness?,' then, is something like this:

"We have won some skirmishes in certain sectors; in others, we have definitely lost ground. However, a plan for victory has been drafted; we will give it the name 'Operation Research.' The outcome of the battle will depend entirely on how soon we put that plan into operation."

Opening Day Discussions

At the opening session on Wednesday morning, following official greetings extended to the Conference by Mrs. Edward G. Brungard, director of public welfare of the City of St. Louis, and Mr. Bigelow's address, two subjects were discussed: the first was "Finding and Helping Children with Impaired Eyesight"; the speakers, Walter H. Fink, M.D., of Minneapolis, and Miss Mary Askew of the Illinois Society for the Prevention of Blindness. The second subject, "Interprofessional Relationships in Eye Care," was discussed from the viewpoint of ophthalmology by Alson E. Braley, M.D., of Iowa City; and from the viewpoint of optometry by James F. Wahl, O.D., president of the American Optometric Association. Digests of all these papers will appear later.

Three workshops were held during the afternoon period of Wednesday and on Thursday morning. Summaries of these panel discussions dealing with the needs of partially seeing children in rural areas; programs for sight restoration and improvement; and the nurse's role in sight conservation will also be published later in the REVIEW.

The presentation of the Leslie Dana Medal was a highlight of the confer-

ence luncheon, held on the second day. Mrs. Audrey Hayden Gradle was the 1954 recipient of this award, made annually for public service in sight conservation.

In presenting the medal to Mrs. Gradle, Dr. Franklin M. Foote, NSPB executive director, reviewed her years of service in the cause of blindness prevention. "After serving for two years as secretary of the Missouri State Commission for the Blind," he related, "Mrs. Gradle reached the logical conclusion that 'preventing blindness is the most intelligent and most useful service' in work for the blind. When, on an August day in 1927, she was asked to bend all her energies to saving and preserving sight, she heeded the call, accepting the position as executive secretary of the Illinois Society for the Prevention of Blindness. This was a momentous decision, not only for Illinois but for the nation. She was to serve with distinction in her chosen field for 18 full years, developing new programs which have been a pattern and an inspiration for other states. Always she worked on the edge of darkness, pushing forward the frontiers of light.

"In all her work, among the qualities of mind and character which impress one are her imagination and her perseverance. The French writer, Joubert, has aptly said: 'Imagination is the eye of the soul.' Certainly the need for imagination in finding ways to protect eyesight is greater today than ever before."

Campaign in Illinois

Mrs. Gradle's skill and tenacity were responsible, Dr. Foote said, for the passage of an effective Illinois law to prevent babies' sore eyes. In the ten years from 1921 to 1931, he related, 77 babies in that state were blinded in both eyes from this one cause. In 1931 Mrs. Gradle maneuvered a suitable bill through the Illinois legislature, only to have it declared unconstitutional by the attorney general and vetoed by the governor. Luckily, the legislature was still in session, and the bill went back to it with the governor's message. The speaker of the House of Representatives declared that in 40 years' legislative experience he had never known a bill to be passed over the governor's veto. This bill was again passed by the House of Representatives with a vote of 116 to 9.

But—the next day in the Illinois Senate the bill was defeated by just six votes.

"Other hearts would have broken under such a defeat," said Dr. Foote, "but not that of our heroine. She must have taken to her heart the admonition of the Roman philosopher, Seneca: 'There is nothing which persevering effort and unceasing and diligent care cannot overcome.'

"She first got the League of Women Voters interested. Then she went to the Department of Constitutional Law of the University of Chicago and was advised that the bill as written was sound and constitutional. She then went into every one of the 51 legislative districts of Illinois, organizing standing committees and making 350 speeches in one year on preventing babies' sore eyes.

"The bill was then introduced in January 1933, and passed the House with a two thirds' vote. In the Senate efforts were made to nullify the bill with amendments. Mrs. Gradle was in close touch with more than 3,100 members of her standing committees.

LESLIE DANA AWARD WINNER Mrs. Audrey Hayden Gradle of California, is congratulated by Dr. Franklin M. Foote, executive director of the National Society for the Prevention of Blindness, who presented the medal at the luncheon meeting of the St. Louis conference.

She had a leading obstetrician from Chicago testify at the Judiciary Committee hearing. She had important church groups behind the bill. At her request, Helen Keller sent an open telegram to the Senate. The baby bill passed with a two thirds' majority. Newly installed Governor Horner signed the bill. Immediately babies' sore eyes as a cause of blindness plummeted in Illinois to one twentieth of the previous rate.

Similar examples of Mrs. Gradle's vision and courage could be cited—her work in getting effective laws passed for the education of partially seeing children, getting appropriations for control of trachoma, starting a glaucoma clinic with good social work follow-up; also, industrial eye programs.

Resigning in 1945 from the Illinois Society, Audrey M. Hayden became Mrs. Harry S. Gradle, wife of the world-renowned ophthalmologist who always had been one of the strongest supporters of work in prevention of blindness and who received the Leslie Dana award in 1946. Now living in California, Mrs. Gradle is vice-chairman of the National Society's California Committee and since 1952 has served as field consultant in prevention of blindness for the Pan-American Association of Ophthalmology.

Response of Mrs. Gradle

In accepting the Leslie Dana Medal Mrs. Gradle spoke of the great joy and satisfaction that was her reward for the years of work "in a cause that

needs no apology—a cause which is sound both economically and emotionally."

"The private agency has the advantage of singleness of purpose," she said. "Many public agencies will be interested enough to incorporate into the programs various aspects of prevention of blindness but to the private agency belongs the peculiar treasure of leadership in this field.

"As I see it, the role of the private agency should be that of a catalyst. Now the dictionary tells us that a catalyst is something that produces a reaction between substances otherwise inert while it, itself, remains unchanged. Who is in a better position to assume this role than a private agency? It should create the plans, outline the programs, and act as a spark plug. Needless to say, the spark plug has to be in good condition or the sparks won't fly.

"The private agency for prevention of blindness should be a coordinating agency. It should serve as a central switchboard for ophthalmologists; public spirited citizens, school systems —local, county, and state; state and city boards of health and welfare. Since a sound, complete prevention of blindness program touches so many facets of the community, it is of the utmost importance that there be no duplications. There is hardly a state department with which a private prevention of blindness agency cannot work, and thus the golden thread of our effort becomes a permanent part of the fabric of the state.

High Standards Needed

"The private agency can act as a demonstrator, and when we demonstrate it had better be good. Only the highest standards, only the most approved methods, only the most efficient, enthusiastic, well-informed and dedicated people should be used for demonstrating.

"On a small amount of private money a project in prevention may be done within a public agency where, if the demonstration is good, it may become a part of the permanent public program; and every time we complete such a successful demonstration we widen the base of our education and the interest in our work.

"I see it also as the duty of the private agency to infect public agencies, who have a hundred other interests, with the zeal we feel about prevention of blindness. We must be able to transfer our enthusiasm to others. This takes time, patience and skill. We have to be able to tell our story briefly, because few souls are saved after the first five minutes, and vividly, or our audience will vanish.

"We should also transfer to our prospective cooperators a sense of urgency—a feeling that every single minute counts in this fight—that every single minute lost may mean the difference between darkness and daylight for someone.

"And I see the private agency as a stabilizer. It is fine to demonstrate so well that we prevail upon some public agency to incorporate a block of prevention of blindness in its program, but what then? It is still our duty to see that the standards of performance which we have set up be adhered to and upheld. This is sometimes an unpleasant and disagreeable job, but it has to be done or our demonstration will have been wasted. This is one of the rocky roads we must travel, but never forget that in work like ours the

road may be rocky, but the view is beautiful. No work that is worth while is easy. There are no short cuts to achievement. We will have to meet vacuums of indifference and apathy. We will have to educate endlessly. But, we must never give up.

Vision of the Future

"I want to dedicate this Leslie Dana Medal for prevention of blindness to those great-hearted men and women, present and absent, living and dead, who, by their vision, have helped us to translate noble impulses into shining realities, and to hope that the record of the future in prevention of blindness will dim the record of the past as sunlight blots out lamp light."

Dr. L. E. Burney's inspiring address on "The Citizen's Share in Public Health Programs," which was given at the conference luncheon, appears in this issue.

Medical Advances

Dr. M. Hayward Post, professor of clinical ophthalmology at Washington University School of Medicine, presided at the second day session on "Medical Aspects of Prevention of Blindness."

Latest results of scientific research into the causes and treatment of glaucoma, cataract, trachoma and strabismus, all important blindness factors, were discussed by leading ophthalmologists. The paper on cataract by Robert Dean Mattis, M.D., of St. Louis is published in this issue. This was discussed at the session by T. E. Sanders, M.D., of St. Louis.

Scheduled for later issues are the papers of Manuel L. Stillerman, M.D., of Chicago on "Electroencephalographic Changes in Children with Strabismus"; K. W. Cosgrove, M.D., of Little Rock, Arkansas, on "Current Status of Trachoma," which was discussed by A. A. Siniscal, M.D., of the Trachoma Hospital, Missouri Division of Health; Ralph O. Rychener, M.D., of Memphis on "Ophthalmic Aspects of Reading Disabilities." An abstract of the paper of Dr. Bernard Becker is published in this issue.

Industrial Problems

The session on the final morning of the conference was devoted to "Progress in Industrial Vision Conservation." The unique program of Delco-Remy Division of General Motors which has had such a far-reaching effect on the community of Anderson, Indiana, was discussed by Fred G. Yelton whose address appears in this issue. Other speakers at this session, whose papers will be published later, were Arthur K. Peterson, M.D., medical director of R. R. Donnelley & Sons Company, Chicago; J. T. Keith, O.D., president of the Ohio State Optometric Association; and Mrs. Margaret L. Steele, superintendent of nurses, American Brake Shoe Company. George L. Mitsch of American Car and Foundry Company presided.

Volunteer State Committees

Recent developments in the NSPB state committee volunteer programs and plans for the future were discussed at the last conference session on Friday afternoon, March 12.

The exhibits at the conference were an interesting supplement to the sessions, featuring control of eye diseases, optical aids, large-type books for the partially seeing, public eye health services and safety.

THE CITIZEN'S SHARE IN PUBLIC HEALTH PROGRAMS

L. E. BURNEY, M.D.

State Health Commissioner
Indiana State Board of Health

The true objective of a community organization, and also of health education, is not the solution of a specific problem but the establishment of an environment in which solutions to all problems may be developed.*

A QUOTATION from Disraeli on the front of our building in Indianapolis reads: "The health of the people is really the foundation upon which all their happiness and all their powers as a state depend."

Health is important to us as individuals and as citizens. Each individual, group or profession has a share in the promotion of positive health; and the citizen probably has the most important contribution to make.

Scientists make their discoveries, the research clinician confirms the findings, and the practicing profession makes the new knowledge available. But the story is not complete without public interest, understanding, and the use of this knowledge. These latter essentials require citizens to assume a share in the program. Sharing requires participation.

As members of voluntary and official health agencies our job is to secure that participation. With our special interests we forget sometimes that the public is not as impressed with the importance of various health activities as we are. Too often we attempt to secure support for programs and services we believe to be essential instead of stimulating individuals and groups to study their own needs and decide what they want to do about them.

Overcoming Inertia

The inertia of the public at times is puzzling. Even more disconcerting and serious is the growing philosophy of allowing a few to do the thinking for the many. I can sympathize sometimes with physical laziness but not at all with intellectual inertia.

Part of the fault lies in the existence of many groups striving to secure public acceptance, and in the resulting bewilderment. This competition is

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, St. Louis, Missouri, March 1954.

healthy and can be resolved if we recognize that it is not our job to tell people what to do but to help them become the kind of people who will know what to do. If we accept this as our responsibility, we will devote our efforts to developing new procedures and methods of bringing our technical and scientific knowledge to the public, who, in turn, will be able to utilize it.

Attitude of the Specialist

Too many public health workers take for granted the essentiality and value of their services as well as the public awareness of the need for these services. We in public health are equipped for our jobs either by experience or training or both. The specialist's attitude toward a certain concept of public health is determined by his previous training and experience. The importance he places upon a drilled well, vision screening, proper sewage disposal, dental health, or nutrition results from five, 10, or perhaps 25 years of intimate contact and association with these matters.

But in his work with the public the specialist is dealing with individuals who have not developed this vital concern. In fact, much of the individual's experience may discourage him from appreciating what the expert accepts as true. To illustrate: A person has not eaten the seven basic foods and has drunk water from an improperly constructed well for many years with no apparent effect upon his health. Thus it is extremely difficult for him as a result of experience to develop great concern about an adequate diet or a properly constructed well. Our attitudes are based upon many years of experience. We cannot expect the public to be greatly impressed or change its attitude or behavior after 10 or 15 minutes of conversation.

Demonstrating the Benefits

In all probability public health workers will have to accept this situation and recognize that people are not interested in public health per se; but they are concerned when we can demonstrate the benefits which accrue to them when certain procedures and services are inaugurated.

Let us take the example of blindness in my State of Indiana. We know that almost 600 persons go blind each year and that there is a total of more than 7,400 blind individuals. Indiana pays $800,000 per year for blind assistance, so certainly we can point out to the citizens the economic as well as the social and emotional benefits of preventing blindness. We can save the taxpayers' money by such a program.

In addition let us not forget that every person in a community has something to contribute to the promotion of physical and mental well-being. Failure to recognize this fact will retard the achievement of our objective. Sometimes the professional health worker may think that he should have the lion's share in planning community health programs. This makes the layman hesitant to participate and to take his part as a citizen. Both the professional worker and the layman have special skills which can be utilized. The health services now being rendered by different professions—official and voluntary agencies and other groups—are the outgrowth of demands made by people for improvement in their health status.

To deal as effectively with today's major health problems as we have with those of the past 50 years, our

efforts must include more and more of the health education approach. Education will secure a better understanding by the individual and by the community of their needs and their responsibility for meeting these needs.

Role of Voluntary Agencies

During the last 40 years many voluntary health organizations have come into existence. Each of these has for its purpose assistance to official agencies in spreading knowledge of health education, encouraging people to practice these teachings, and securing a better understanding by the individual and the community of their needs in a specific area and their responsibilities for meeting these needs.

The voluntary health organizations have been a helpful adjunct in promoting the health and welfare of citizens of the United States. Since they are not official, tax-supported groups they have freedom to do special things which are not allowed the official governmental agency. For example, in Indiana the state Committee for the Prevention of Blindness has been able to contribute toward research in causes of glaucoma at Indiana University Medical Center. Of course, if the cause and treatment for the cause of glaucoma can be determined, we will be able to prevent this type of blindness. However, since official agencies are tax-supported, their participation in research activities is generally limited and this type of activity must be left to the voluntary group. Too, the voluntary agency, having more freedom in expenditure of its funds, is able to evaluate different methods and determine which ones are most suitable for specific situations.

The desire for good health has not always been the motivating force in securing necessary action in public health; neither has there always been public understanding of such objectives. Perhaps public understanding was not so essential in securing a safe water supply or the benefits of other procedures from which people have benefited with little or no action required on their parts.

New Problems

The problems that we have met and solved in the past are quite different from those we face today. It is entirely possible that the methods used in the past will not prove effective against present-day health problems. The successful worker in the future will be the one who fully appreciates the importance of creating an environment in which people can consider their needs and plan to meet them.

Those of us concerned with public health services must recognize that good health cannot be forced upon the public; they must want it. Strong and effective health education programs are a major function of every successful health agency in the country today. Of singular importance, too, is the fact that most of them include the promotion and advancement of community organization as one of the major program responsibilities. As we continue our educational efforts we discover a tremendous untapped resource of leadership in the communities. It falls to both official and voluntary agencies to encourage and develop this, so that communities will be in a better position to provide their own health services. In Indiana we have encouraged the formation of public health councils to help us define public health needs and develop programs.

Community Projects

Our work has convinced us that community organization is necessary for the prevention of blindness in our state. An example is the vision conservation program that is being conducted in the Anderson city schools. Almost two years ago interested citizens there decided that concerted community effort was needed to solve existing school health problems. The school superintendent called together representatives of local service clubs, voluntary agencies, health department, medical and dental societies, industry, business; also teachers, nurses, custodians, parents and students. They sat down together to discuss the solution of common problems and the coordination of services that already were being offered the school. Since then they have been able to determine their health needs and, with knowledge of the proper methods, meet these needs successfully.

Several years ago a pilot dental care project was proposed for school-age children in one Indiana city. The Dental Health Council of the Indiana State Dental Association approved the study and assumed responsibility for securing local understanding and support. Local acceptance required a six cents increase in the school city tax rate. Two years later, after countless meetings, large and small, covering every facet of this city's population, the project was approved.

The time was not wasted. Citizen interest and participation were essential to the success of the pilot study. A similar one in another state was approved by the mayor without an informational and educational program. This is an example of doing things "for the people." The approach preferred is more action "of the people and by the people."

Lack of citizen sharing and participation can defeat worthy projects. A county in Indiana had no hospital. A few leading citizens decided to propose a referendum on a bond issue for the construction of one. They were urged to take at least a year for an educational program. This suggestion was disregarded. The referendum was held and soundly defeated. Three years later, following an intensive educational program sponsored by a large citizens' group, the bond issue was approved overwhelmingly. Failure to secure citizen understanding and active participation delayed the project at least two years.

Results of Local Initiative

School authorities and PTA groups in two adjacent predominantly rural counties decided to study the food habits of children. Technical assistance was requested from the State Board of Health. The study demonstrated dietary deficiencies. In one county the two groups, with the assistance of the press, planned and executed an extensive educational program directed at providing more green and leafy vegetables in the children's diet. In the other county, consumption of milk was found to be extremely low. School and PTA groups, with the fine assistance of the press and radio, conducted a county-wide educational program. A re-study in these two counties months later revealed surprisingly good results which could not have been accomplished by the State Board of Health. The citizens themselves decided upon the study, they did the work, analyzed the results, and developed an action program to

remedy the situation. This is local initiative at its best.

If we think of the family unit and the community as a whole we cannot have a narrowly vested interest for we shall have a common objective—better health for all people. It is apparent that the health of the community is not a group of specific interests such as "diabetes," "cancer," or "heart disease," but it is a single interest with different aspects. As those who represent different phases work together, the unity of the task is recognized and the best results are secured for all.

We should remember that the immediate accomplishments of community organizations are not the most significant. While such achievements improve the community and better the status of each individual living therein, perhaps the greatest point of significance lies in the potential benefits which can be derived from such a joint expenditure of effort and energy. As those in such organizations solve immediate problems in accordance with the guiding philosophy, they do two things: they eliminate the initial irritant, and they set up an action pattern for the solution of future problems. The habit of planning and working together begins to establish itself and the machinery for setting up and carrying through almost any kind of project is strengthened.

The citizen has a major share and responsibility in public health programs. The professions contribute their knowledge, skills, and experiences; the citizen contributes his interest, understanding, and active participation. The sum of all the parts is required to make the whole; nothing less will achieve the objective of better health for all.

New Grant Announced at NSPB Board Meeting

A $15,000 grant permitting a three-year study into the causes of retrolental fibroplasia, now responsible for almost half the blindness among children of the preschool years, has been made available to the National Society for the Prevention of Blindness, it was announced on May 21 at the annual meeting of the Society's Board of Directors at the Hotel Delmonico.

The sum has been contributed by the E. Matilda Ziegler Foundation for the Blind. In reporting the new grant, Dr. Franklin M. Foote, NSPB executive director, said RLF now causes 48 per cent of blindness among young children, even though it was only first recognized in 1941.

"This vicious eye condition," he said, "selects for its victims only premature babies of low birth weight, and has been increasing at a truly startling rate. The thoughtful gift we report today will enable greater mobilization of the facilities of scientific research in tracking down its causes."

During the business meeting, Mason H. Bigelow was re-elected president of the National Society. Mr. Bigelow, former president of the New York State Bar Association, heads the law firm of Gould & Wilkie. Named as vice-president was Donald D. Hoover, president of the advertising firm of Bozell & Jacobs.

New members of the executive committee include: Robert F. Irwin, Philadelphia attorney and former president of the Philadelphia Committee for Prevention of Blindness; Walter K. Earle, New York attorney; and Peter M. Murray, M.D., president of the New York County Medical Society.

Vitamin A Deficiency Impedes Fetal Eye Development

CONGENITAL malformations of the eye, urogenital system and heart were induced in the young of female rats maintained on diets deficient in vitamin A, said Dr. Josef Warkany of the University of Cincinnati College of Medicine in a lecture delivered to the Harvey Society of New York.

Young female rats, soon after weaning, were fed a regimen so low in vitamin A that growth and reproduction were impossible without supplementary carotene. Growth and maturation were achieved in these animals without allowing vitamin A storage, by adding measured amounts of carotene to the diet. At maturation the rats were placed on a diet completely devoid of carotene and vitamin A, and breeding was attempted.

In about 75 per cent of the offspring Dr. Warkany and his associates found malformations of the eye, urogenital system and heart, forming a characteristic pattern. Abnormalities recognizable on external inspection such as edema and open eyes, which are abnormal in newborn rats, may be present. The majority, however, appear normal externally but reveal anomalies when sectioned. The eye is the organ most frequently affected. Retrolenticular fibrous tissue in place of the vitreous is characteristic of the eye anomaly. Other maldevelopments often seen are coloboma, eversion and abnormal structure of the retina, and rudimentary development of the iris and of the ocular chambers. Corneal defects and lid anomalies are rare. In the mildest forms only retrolenticular fibroplasia is found.

The most recent experiments of Dr. Warkany's group have resulted in a modification of this syndrome. The maternal dietary deficiency was interrupted by the administration of large amounts of vitamin A on the 11th, 12th, 13th, 14th, or 15th day of gestation. The percentage of abnormal young became smaller the earlier the supplement was given. According to the date of vitamin A administration, the prevalence of particular anomalies changed, and the anomalous pattern was affected. When vitamin A was given on the 13th day ocular and urogenital anomalies decreased and cardiovascular anomalies increased. Deficiency of vitamin A damages the heart and aortic arch system of the rat fetus before the 13th day of gestation, but interference with the development of the corpus vitreum of the eye occurs later. Thus, retrolenticular fibroplasia in rats can be prevented by vitamin A supplements on the 13th day, while heart anomalies cannot.

Dr. Warkany's lecture was published in *The Harvey Lectures 1952-1953*, Series XLVIII, Academic Press, Inc., New York, 1954.

Current Concepts and Recurrent Misconceptions of the Treatment of Senile Cataract

ROBERT DEAN MATTIS, M.D., F.A.C.S.

Assistant Professor of Opthalmology
St. Louis University School of Medicine

At the present time there is no treatment for cataract other than surgery. Some of the "cures" recommended in pseudo-scientific pamphlets now in circulation are a real menace not only to persons with this condition but to those with other potentially blinding diseases.*

THE cause of the senile cataract is unknown. At present we may only generalize that in the lens, which in view of its importance has a fantastically low metabolism, there is some catabolic excess or failure in nutrition which results in opacification in the aged. These deficiencies are now under study in many of our outstanding laboratories and the future may possibly bring us knowledge with which to hold back this manifestation of the aging process.

Senile cataracts are on the increase, and at a statistically greater rate in more civilized society because of the increase in life-span in this group.

Just as obstetricians have referred to the multifold signs and symptoms of normal pregnancy as the "physiological pathology" of this state, so may we consider senile cataracts as physiologically "normal" in the aged. Our feelings toward them should be analogous to our tolerance of wrinkles, grey hair and the numerous other pathological findings which are normal in the geriatric physiology of the essentially healthy old person. If we accept this concept and convey it to these people we have won the first battle, the conquest of the fear of the unknown. Pitifully enough, to many average citizens the word "cataract" is as horrible-sounding as "cancer" and the more ignorant the patient the worse is the imagined outlook. The first treatment then is explanation. The worker with the blind and the ophthalmologist are morally obligated to try to give the patient peace of mind.

At the risk of oversimplification and perhaps slight scientific inaccuracy by reason of overgeneralization the following might be said:

It is common knowledge that as the body ages it becomes harder and drier;

*A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, St. Louis, March 1954.

the bones become brittle, the joints less mobile, and the skin wrinkles. The lens within the eye loses some of its water content; its chemical constituents change, and it becomes less elastic and less transparent. This is "normal" in old age as it happens to all of us if we live long enough.

If this reduction of the transparency of the lens becomes marked enough it begins to interfere with vision. We call the clouding a "cataract," a term derived from the Greek word for veil. When this veiling of vision begins to interfere seriously with useful vision we remove it; but if it doesn't bother the patient we watch it periodically to be sure it will not give trouble. Frequently cataracts reach a non-progressive stage while still not very advanced, and many more people take early cataracts to the grave with them than ever have to have an operation.

There is no treatment for cataract other than surgery unless it be that the patient take good care of his general health, for the eye is only as healthy as the whole body. Adequate food, rest, and elimination are necessary. Normal use of the eyes will not accelerate the development of the cataract. No special lenses nor treatments of any sort will retard it.

If the vision becomes so poor as to interfere with the patient's useful, normal activities, he becomes a candidate for surgery. He has an excellent chance of good vision afterwards provided that prior to operation he was (a) in good general mental and physical health; and (b) suffering from no other ocular disease which would negate the good technical surgical result. Periodic examinations are necessary, so that the surgeon may maintain a current awareness of the patient's status on the above points.

Medical Treatment Fallacies

It is plain dishonesty even to imply that short of surgery there is any treatment of cataract. However, so-called "medical treatments" are periodically foisted upon the hopeful public by greedy, unethical drug peddlers who perpetuate this spagyric myth. Obviously this reference is not intended as criticism of the conscientious ophthalmologist who must occasionally utilize a placebo in dealing with a case that is inoperable by reason of preexisting ocular disease which would doom the effort to failure; or because of debility or other valid reason. Some elderly patients have an amaurophobia which borders on dementia. In such cases brutally taking away all hope of some sight could precipitate suicide. The sensible physician in such cases explains his conduct to some responsible friend of the patient or member of his family. This procedure is in the finest humanitarian tradition of the Healing Art, and is not to be confused with the tri-weekly or even daily visits for "medical treatment" to the almost extinct " 'drops' doctor" of the past.

Twenty years ago in writing of the nonsurgical treatment Clapp[1] stated that the multiplicity of treatments indicated the inefficiency of all of them. Following a discussion of the worthlessness of an ancient aromatic electuary, he mentioned not inappropriately the current "lymphogogues" of his day. These were honey, glycerin, and Dionin (ethylmorphine hydrochloride), all of which time has proven to be useless, other than as Clapp summarized all medical treatment for cataracts: "Probably the chief benefit

is derived from the psychological effect in making the patient mentally more comfortable." He also described the treatment of the 20's which consisted of all types of collyria, injections of sodium and potassium iodide, cyanide of mercury, and resorcin; and the ingestion of large amounts of vitamin A and thyroid extract. Concurrently, various physical means were attempted, among them radium and gamma radiation (which can *cause* cataracts), diathermy and "violet rays," vibratory massage, cold douches, and radiant heat.

As Clapp notes, the idea of "lens feeding" was not new even in 1934. He attributes its first use to Konigshafer in 1897, and comments without favor on the use of lens antigen or serum by Römer, and later by Davis. He expresses approval of the work of Ellis in refuting the previous beneficial claims for this method of treatment.

Many of the "Hints on Treatment" pamphlets are still widely circulated. These are benignly helpful in tone. They are loaded with just enough pseudoscientific references to the literature, carefully spiced by quotations lifted out of context from acknowledged authors (i.e., Walter B. Lancaster and Franklin M. Foote[2]; and Adolph Posner[3]), as to constitute a real menace not only to people with cataracts, but to those with other potentially blinding diseases.

The cautious physician demands that a few criteria be satisfied before he utilizes an unfamiliar drug:

He wants it identified, pharmacologically at least, and by chemical structure if possible, by reputable investigators. He insists that a satisfactory thesis concerning it has been stated by persons of recognized competence and probity, and preferably that the investigation has been conducted under the auspices of an institution of good academic standing. He requires that sufficient animal experimentation has been done to assure him of its efficacy in vivo and to guard against unappraised toxicity. Finally, he accepts or rejects the thesis not only on the evidence but also on the basis of "Who said so?"

Fraudulent Claims

Probably the least pernicious of the current "medical" treatments for cataract is the product Succus Cineraria Maritima, priced at $6.00 per ounce, and described by its maker, Walker Pharmacal Company, St. Louis, Missouri, as a "lymphogogue stimulating the flow of lymph—probably secondary to the stimulation of the ocular circulation which is very desirable." The company does not point out, however, that there are no lymphatics in the lens—if present in the eye in any form—and that both infra-red radiation and uveitis cause a stimulation of ocular circulation and yet both are known causes of cataract.

The extract is apparently non-toxic, is irritating on instillation, and is probably no more effective nor harmful than its contained glycerin which was tried years ago to arrest cataract formation. This product satisfies none of the above criteria warranting its use as a drug.

In 1911 the Council on Pharmacy and Chemistry of the American Medical Association reported on the utter worthlessness of Succus Cineraria Maritima as a cure for cataract. Casey E. Wood[4] in 1941 reported that the extracted juice of Senecio Cineraria, a plant known as the "Dusty Miller" or

as Ragwort, was still being used by a few men with "respectable names," but made the statement that the therapeutic effect was "the same as pouring drugs down the patient's back."

The Federal government under the Food and Drugs Act proceeded against the maker, charging that the solution was misbranded and that the claims that it was a remedy for cataract and other opacities of the eyes were "false and fraudulent," and "applied knowingly and in reckless and wanton disregard of their truth or falsity." The company pleaded guilty in February 1916, was fined, and discontinued the illegal labels on the nostrum, but the advertising claims continue to evade the spirit of the law despite continued attacks by the Council on Pharmacy and references in the *Journal of the A.M.A.* periodically from 1910 to 1951.[5,6]

Use of Hydrosulphosol

This compound, first mentioned in the literature in 1948, was described by Kuhn[7] as valuable in the treatment of chemical and thermal burns of the eyes when used in 1:20 dilution in castor oil. For the prevention of symblephara and to protect the cornea while the eye heals, as well as to neutralize any free alkali (in that type of chemical burn) and absorb irritating aromatic hydrocarbons, has been the function of fatty acid esters for countless years and castor oil has been and still is a standard and very satisfactory medication. There is no evidence that the addition of Hydrosulphosol to castor oil is of any particular merit. It is advertised for sale to physicians for $3.00 an ounce, which is a handsome price considering that it is 95 per cent castor oil; and in none of its literature does the company specifically identify the "active" ingredient, let alone state its concentration.

The manufacturer, E. C. Lientz Sales Co., Fillmore, California, in a letter to the writer dated February 15, 1954 supplied only the following description of the product: "High potency concentrate supplying highly reactive sulphur complexes of calcium polysulphides and thiosulphates containing a labile sulfhydryl group." The accompanying house-published printed material includes only a few references to legitimate investigators—e.g., Morton Grant's paper[8] on chemical burns of the eye, from which certain phrases have been taken out of context. The references cited were largely "personal communications" from individuals who when checked in the Directory of Medical Specialists were found wanting in research background, as outlined in the criteria established earlier in this paper, either from the point of view of training, institutional association, or both.

The product is offered for oral administration as well as for instillation into the eyes for the cure of cataracts, diabetic retinopathy, corneal scars, postoperative dystrophy, iritis and chorioretinitis, dendritic keratitis, vernal conjunctivitis, and recurrent hemorrhage (due to infection, diabetes or hypertension); and in the large economy size, Hydrosulphosol is available for colonic irrigation.

A letter dated February 25, 1954 from Dr. R. T. Stormont, secretary of the Council on Pharmacy and Chemistry of the American Medical Association, states: "Hydrosulphosol had been submitted for consideration for acceptance by the Council on Pharmacy and

Chemistry. Although the firm has been requested repeatedly to do so, it has not as yet furnished any acceptable medical evidence that Hydrosulphosol is of value in the conditions for which it is being promoted."

It is hoped that the U. S. Food and Drug Administration will investigate this so-called "cure" and prevent further exploitation of the public as there is no basis in biochemical or physiological fact for the preposterous claims made.

Fish Lens Protein Injections

Although we may for the moment discount the long-term harmful effect on the patient of using the preceding compounds, and consider them merely as buzzing, annoying hoaxes, we must regard the fish lens protein treatment as a jet plane loaded with delayed-action bombs. To be human is to be a Paracelsian — an iatrochemist — at heart, for were all the phenomena of life and disease based on chemical action it would be only a matter of time when all the formulae would evolve and there would be no illness, no old age, no death. From such wishful thinking have no doubt resulted the numerous attempts to "feed," as it were, the ailing lens with extracts of mammalian lenses or with the antigens from the serum of animals sensitized by injections of human lens protein. These baseless conjectures were reactivated recently when certain differences were noted between fish and mammalian lens protein, in chemistry, and immunologic and antigenic characteristics, by non-clinical research men.

In September 1952 there appeared in *Science* a report by Shropshire, Ginsberg and Jacobi[9] of a fantastically successful non-surgical treatment for senile cataract by injections of fish lens proteins, which had been started late in 1950. Almost simultaneously with the publication of the paper it became apparent that dangerous sensitization to lens protein had already taken place in many patients who had received the "treatment" and the Council of the American Academy of Ophthalmology and Otolaryngology requested that the Committee on Ophthalmology of the Division of Medical Sciences of the National Research Council investigate the work of Shropshire and his associates.

Report of Posner

Before the study could be carried out Posner[10] reported a case in January 1953 of bilateral uveitis subsequent to a course of 50 injections of the Shropshire fish lens extract (during which course the patient had a violent sensitivity reaction to an intradermal skin test, and in spite of which the treatment was continued). The severe uveitis was helped by cortisone and after the extraction of both lenses the patient recovered. In the same paper was described a previous case seen in 1926 with bilateral endophthalmitis resulting from 36 injections of Davis's[11, 12] lens extract which was described at the same International Congress of Ophthalmology at which Verhoeff and Lemoine[13] described the sympathetic-like uveitis resulting from the sensitization of the body to its own lens protein.

Posner further stated in this same article that this "complication can be produced in experimental animals by sensitization to lens protein" and is "tissue specific, not species specific, so that repeated injections of protein derived from fish or other animal lenses

may sensitize the human eye to the protein of its own lens." Finally, he alerted us to the fact that to his knowledge approximately 1,000 patients with cataract had received the lens protein injections and were in potential danger* if they were reluctant to report previous unsuccessful "medical" treatment of their cataracts.

Posner's dire prediction was fulfilled. By June 1953 Breinin[14] reported three cases of fish lens protein sensitization uveitis, one of which recovered despite bilateral secondary glaucoma after intracapsular extractions, and one case in which there was a very stormy convalescence resulting from a uveitis secondary to the reaction to the lens material left within the eye after an extracapsular extraction. Cortisone and corticotropin aided the recovery. He advises that all lens protein sensitivity cases be skin tested either with the patient's lens when removed from the first eye, or else with lens antigen prepared in the manner of Verhoeff and Lemoine as prophylaxis against development of phacoanaphylactic endophthalmitis. Also he states that in sensitization uveitis intracapsular extraction is to be greatly desired.

Committee Report

The committee,[15] sparked by Dr. Alan C. Woods, published the report of the investigation on June 20, 1953. In summarizing the studies in lens protein treatment of cataract it covered the field from Römer's oral treatment through Davis's papers (1922–25) to that of F. Park Lewis (with whom Shropshire was then associated) in 1933, and found that all of these treatments had failed to stand up under clinical investigation.

Shropshire's[16, 17] additional papers in 1937 not only misquoted other authors but thereby propounded a fallacious theory of the distinctive antigenic therapeutic value of a previously undescribed sulphur-bearing amino acid in fish lens protein.

The committee found that experiments on galactose-induced cataracts in rats (which can appear to clear when galactose is withdrawn) was the experimental basis for the utilization of lens proteins in human cases which were reported as benefited from lens protein administration. As determined against the original estimate by the non-ophthalmological investigators, the committee found a suggestion of improvement in only one of 11 patients. The subjective improvement in these patients was in near vision which is the functional myopia of progressing cataract—so-called "second sight."

An independent report by a staff ophthalmologist of a recognized medical school using the Shropshire fish lens protein noted no improvement in nine cases. Of the samples of the fish lens protein supplied to the Ocular Research Unit of Walter Reed Hospital, 10 out of 12 were contaminated by pathogenic organisms.

Shropshire had no formal scientific training although claims had been made that he was a graduate physician and had been an ophthalmological chemist connected with two universities. Convicted of forging narcotic prescriptions, he was jailed in 1944 and his parole was revoked in 1948 on the charge of issuing bad checks, alcoholism, and suspected use of narcotics. About two years later, with his collaborators, he formed the Cataract Institute of South Kortright, N. Y.

*and *are* at the time of this writing if they are still alive

When last heard of he was again "in a Florida prison on a narcotics charge."[18]

The committee found not only that the "cure" was of no benefit but that the treatment was potentially dangerous in that it might seriously interfere with subsequent surgical removal of the cataracts in the patients treated by the fish lens protein extract.

Future Non-Surgical Treatment

It is a rule of ontogeny that as a cell or a tissue develops from its basic state and becomes specialized in form or function it sacrifices a portion of the elemental vitality of the basic state in a degree proportionate to its level of specialization. A single lens fiber but for the accident of location in the placode rather than on the outside of the later-formed lid might have ended as a basal cell under the brow; and rather than have collected a million lights would have borne a million cells to be raised and lowered a thousand times a day like a window shade. A cell of the lens, placed as it is like a sardine in a can, is practically born dead (or at best a vegetable). Its only function is to be pushed back and forth and passively transmit light and metabolites to and from its neighbors to the capsule which protects it from the nutrient medium about it.

This cell is an organism unable to protect itself from its own food, yet is a link in a chain which if broken can enchain the whole body immobile in the darkness. While dependent on its neighbor to transmit its existence, given a little nourishment it usually outlives the body it lives on. So long as the lens is thus characterized we will have senile cataracts, and only when (if ever) our clever researchers find the magic elixir (other than embalming fluid) that will keep the hair dark, and the skin firm and unwrinkled, that solution will cure senile cataracts while restoring hair to our bald pates. Until then medical care of the preoperative cataract case is symptomatic, supportive, and psychological.

As emphasized earlier, our duty is first to educate patients who are to be operated on so that they may be free from fear of the unknown and, understanding their condition, will not flee in panic to the fleecers. Next we must warn them not to be overconfident so that, trusting less-than-useful vision, they may be hurt; may suddenly find themselves prostrated by an attack of acute glaucoma brought on by a rapidly swelling lens. This latter danger was more common in the past when as Kirby[19] says: "Ripeness was significant in extracapsular extractions where the sticky immature lens was difficult to remove and there was postoperative irritation as the cortex was absorbing." Now most cataracts are removed intracapsularly, electively, when the need for useful vision indicates that the time has come for surgery.

We must observe these cases at appropriate intervals, depending on the rate of progression of the opacities, watching for supervening chorioretinitis, tumor, retinal detachment, glaucoma. We must maintain liaison with the general physicians so that they will inform us of any significant variation from good mental and physical health.

Refractions should be frequent enough so as to give the patient the best possible visual acuity in spite of his cataract, and so that we can inform him if surgery is in the offing, rather than have him come in consternation

as he suddenly realizes he is reaching the end of his rope. Dark glasses to reduce the dazzling are not mandatory but some patients find them comfortable and helpful.

Sympathy begets confidence, and that in turn assures the surgeon of the best possible cooperation in the trying early convalescence. Encouragement is not amiss. It has never hurt any sick person to be allowed to have a little hope that all is not quite so bad as he thinks it can be.

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FEE-SPLITTING CONDEMNED

An editorial in the March 1954 *Journal of Medical Education* charges the medical schools with the responsibility of making sure that their graduates are aware of the unethical nature of fee-splitting. The American Medical Association and the American College of Surgeons for many years have condemned this practice, which permits financial considerations to bias the scientific judgment of the physician and surgeon.

RECENT WORK ON AQUEOUS OUTFLOW*

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Washington University School of Medicine, St. Louis

RECENT work in a number of laboratories has concentrated attention on the mechanism of outflow of aqueous from the eye. It has become increasingly apparent that it is disorders of this outflow mechanism that are at fault in almost all forms of glaucoma. Although admittedly not the entire story, for teaching purposes one may oversimplify the dynamics of the inflow and outflow of aqueous humor of the eye and their relationship to intraocular pressure (Figure I).

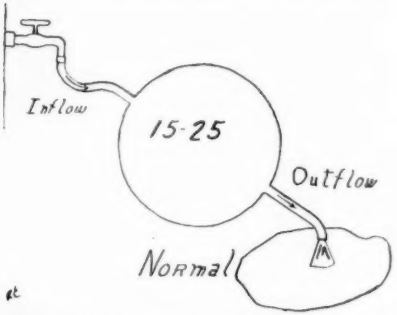

FIGURE I—Schematic representation of normal eye with inflow and outflow mechanisms so regulated as to maintain normal intraocular pressure.

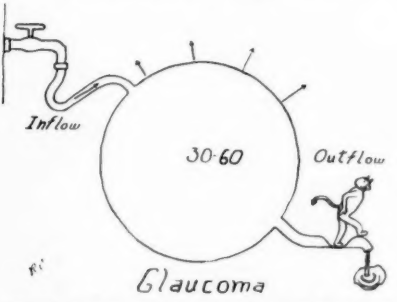

FIGURE II—The glaucomatous eye with increased pressure resulting from obstructed outflow.

The disorders induced in this carefully regulated system by the glaucoma "demon" may be represented as in Figure II.

Tonography provides a practical method of measuring aqueous outflow. Although this test is subject to sources

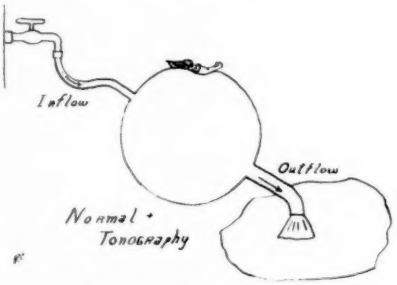

FIGURE III—Tonography in the normal eye.

of error and details of its interpretations are open to criticism, the over-all principles and conclusions are well defined.

When one applies a given weight to the eye, fluid is expressed from the eye at a rate dependent upon many factors, one of which is the ease with which fluid leaves the eye (facility of outflow). This factor will be enormously different in glaucomatous and normal eyes, as represented diagrammatically in Figure III and Figure IV. It is apparent that the glaucomatous eye will resist indentation and expression of fluid. This failure to indent ("flat tracing") permits the early diag-

* Abstract of a paper presented at the Annual Conference of the National Society for the Prevention of Blindness, St. Louis, March 1954.

nosis of glaucoma. Furthermore, when used in conjunction with conventional provocative tests, tonography provides an exquisitely sensitive method for discovering the earliest cases of glaucoma. Tonography also provides a

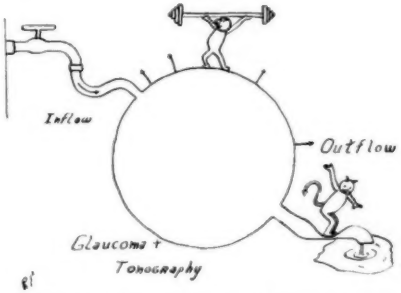

FIGURE IV—Tonography in the glaucomatous eye.

unique method for the evaluation of the adequacy of medical and surgical therapy.

Tonography has proved its worth to the ophthalmologist not only in the important realms of diagnosis and therapy, but also in the more basic and far-reaching problems of the pathogenesis of the glaucomas and the mode of action of our therapeutic attempts. It can be demonstrated, for example, that such procedures as iridencleisis or pilocarpine administration decrease intraocular pressure by improving the outflow mechanism,

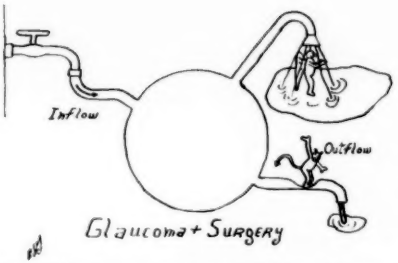

FIGURE VI—The pressure-lowering effects of filtering operations on the glaucomatous eye.

whereas cyclodiathermy does so by decreasing inflow of aqueous. These results may also be illustrated diagrammatically. The pilocarpine "angel" may be represented as relieving the obstructed outflow and thus reducing intraocular pressure (Figure V). The filtering operations lower intraocular pressure by providing new channels for the outflow of aqueous, thus by-passing the obstruction (Figure VI).

Recently oral Diamox therapy has been introduced as a new method for lowering intraocular pressure in glaucomatous eyes. Tonographic tracings on these eyes have revealed that the dramatic fall in intraocular pressure induced by this drug is related to an inhibition of the secretion of aqueous humor. Thus, the Diamox "angel" may be represented fancifully (Figure

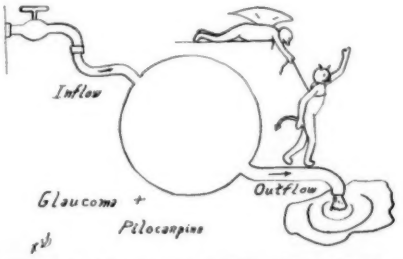

FIGURE V—The pressure-lowering effects of pilocarpine administration on the glaucomatous eye.

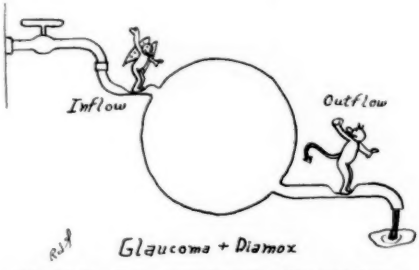

FIGURE VII—The pressure-lowering effects of Diamox on the glaucomatous eye.

VII) as decreasing the inflow of the aqueous humor. Diamox is in effect a medical cyclodiathermy which has the advantage of being controllable and reversible. Tonography reveals not only the intimate mechanism of the action of this agent, but also provides one of the best methods available for following the progress of the glaucomatous process in these patients.

The illustrations in the foregoing article are by R. W. Eckdahl, M.D., and Richard S. Greenberg, M.D., postgraduate students in Ophthalmology, Washington University School of Medicine, St. Louis.

AAOO Home Study Courses

Home study courses in the basic sciences related to ophthalmology and otolaryngology are offered as a part of the educational program of the American Academy of Ophthalmology and Otolaryngology. The 10-month courses will begin September 1, 1954. Registration must be completed by August 15. Dr. William L. Benedict, secretary-treasurer of the Academy, will provide detailed information and application forms, at 100 First Avenue Building, Rochester, Minnesota.

Two-State Vision Study

A vision survey is being conducted in Mississippi and Louisiana by the respective state boards of health and education in cooperation with the department of ophthalmology of Tulane University School of Medicine, the W. K. Kellogg Foundation, and the National Society for the Prevention of Blindness. Its six-fold purpose is to prevent blindness by diagnosis and treatment before the fact rather than after; to determine the prevalence of eye defects in the area; to estimate the type and amount of eye care needed for the general population; also dissemination of the information obtained to training centers; evaluation of present educational programs training specialists in the care of eye diseases and defects; and the formulation of an intensive vision conservation program for these areas and the country at large.

The vision survey team consists of an ophthalmologist, technicians and a clerk, and operates from a well equipped mobile unit. Farm groups, 4-H clubs, school, college, civic and industrial groups, pre-school children, and all persons believing they have eye defects are examined. For treatment or prescriptions patients are referred to local practitioners of their choice.

Dr. William B. Clark, professor of ophthalmology at Tulane and chairman of the survey, states that "cold statistics" prompted the project. "It is estimated," he said, "that there are now in Mississippi and Louisiana roughly 14,000 people who are completely blind. With proper diagnostic and treatment services, half of these cases could have been prevented."

Golden Mike to Mrs. Tullis

Mrs. Hellen Tullis of Baltimore was awarded the *McCall's Magazine* Golden Mike for her outstanding television program "As You Can See." Mrs. Tullis, who is blind, devotes her weekly program to interviews with handicapped people, presenting their major problems, and dispelling public illusions about them. Mrs. Tullis brings to her audience the conviction that handicapped persons can assume normal privileges and responsibilities in society.

HOW DELCO-REMY BUILT A VISION PROGRAM

FRED G. YELTON

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General Motors Corporation, Anderson, Indiana

Against a background of twenty-five years with the Delco-Remy Division, first as an operator and later as a member of supervision, the author discusses this unique cooperative plan which has had far-reaching effect on the community.*

THE Delco-Remy Division has 10 plants in Anderson, Indiana, with some 15,000 employees. In the manufacture of electrical equipment for passenger cars, trucks, buses, farm tractors, marine and industrial engines our operations are geared for high-speed production. About a third of our people are women, employed largely in assembly departments.

At the outset of World War II I was asked to join the personnel department to reorganize safety engineering. After several weeks of research, consultations and operations studies my task actually began.

Firmly convinced that our eye protection program was inadequate we started by discarding several thousand dollars' worth of plano goggles that were most unsuitable for modern use. They were replaced with a large stock of the most modern type of eye protection in a full range of sizes and a variety of frame styles. Our staff of safety engineers was given semi-professional training by optical supply firms and became quite adept at individually fitting each person. Through job studies we declared certain occupations and areas to be restricted for eye protection. Our program started to roll and immediately eye injuries were reduced.

Individual Problems

It was and is my personal conviction that we are not doing justice to our prospective employees or those already in the plant unless we attack every vision abnormality of the individual. For this reason we began working simultaneously with the professional eye people and the optical manufacturers on an acceptable share-cost arrangement by which we could make prescription safety glasses available to all employees. Meeting with ophthalmologists and members of the optometric profession in our locality, we emphasized the potential of new business offered by our industrial program. The medical men agreed voluntarily to scale down their examining fees, as did the optometrists. Special prescription cards were supplied to our employees certifying that they were to share in the cooperative benefit plan. Almost immediately we began supplying prescription safety glasses to approximately 200 employees a month. We were literally buttonholing pa-

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, St. Louis, Missouri, March 1954.

tients and throwing them into the professional eye men's doors.

Everyone was surprised at the eye consciousness so quickly created among such a large employee group. True, we capitalized on all unfortunate mishaps and used all promotional media in gaining acceptance of the program. The volume of business created for the professional eye men was so great that they soon began to view the program with alarm, especially in view of an even greater potential. They insisted on protecting their professional diagnosis by using a coded prescription card. This was easily worked out and the program was again accelerated.

I should like to emphasize the importance of making available to industrial employees every type of refractive lens that is known to the profession: all types of bifocals, trifocals, cataract lenses with a variety of base and corrected curves, including all recommended tints.

Among our somewhat stabilized 15,000 employee group are a large number with records of many years of continuous service. As we developed our program we found that many were approaching or had reached a time in life when eye correction was needed. We worked with this group of approximately 6,000 and covered them in a reasonably short period.

First Four Years

During the first four years of our intensive campaign we concentrated only on areas and departments where job studies had indicated that hazards were greatest. But as our employment grew in the post-war period, and particularly as we engaged in the Korean situation, we saw an excellent opportunity to embark upon a 100 per cent eye protection-correction program. Additional occupations were covered as rapidly as we were able to service such groups. By April of 1953 our objective of plant-wide eye protection had been achieved. In 1952 and 1953, while we were cleaning up the program, so to speak, more than 300 employees per month went into the vision correction phase. During these two years more than 7,200 obtained prescription safety glasses.

Vision Testing Procedure

As mentioned before we used every known promotional idea. Perhaps the most important step was the inauguration of a vision testing program in conjunction with pre-employment physicals. Started in 1950, it was immediately extended to our 15,000 employees by obtaining a sufficient number of the screening devices and training a number of registered nurses. Letters were sent or given to each employee describing the findings of the professional people, and recommending additional eye care where indicated. Some factors influencing referral were: age of present prescription; frequent headaches; history of styes, inflamed lids, bloodshot eyes; light sensitivity; history of eye injury regardless of the grade; no previous examination by a vision specialist; falling asleep on repetitive operations; ocular fatigue or irritation at end of work period; visual requirement of job; abnormal findings in hypertension; complaints of safety glasses affecting vision; evidence from accident record of narrowed visual field.

Wise Owl Club

Supplementing our all-out efforts in the field of vision testing we adapted other promotional techniques. Shortly

after the American Car and Foundry Company originated the Wise Owl Club of America and delegated the National Society for the Prevention of Blindness as the sponsoring agency, we applied for a charter. This was granted on October 10, 1949. By February 22, 1954 fifty-two employees of our division had been certified for membership, having prevented loss of vision to one or both eyes through the wearing of approved eye protection. Each of these cases was highlighted through the plant publication, bulletin board displays and press releases. Membership certificates and pins have always been presented by top management at appropriate ceremonies.

Perhaps the highlight of all such awards occurred when one of our employees on December 9, 1953 qualified as the 5,000th member of the Wise Owl Club. When advised of this by telephone call from James E. O'Neil of NSPB in New York, we quickly arranged for the certificate and pins to be presented by the Governor of our state, the Honorable George N. Craig. This was done in the office of our general manager, H. D. Dawson, who participated in the ceremony. Since then we have certified three additional members. This fine group of Delco-Remy Wise Owls, who have benefited so much by eye protection, assist in making our vision conservation program somewhat self-supporting.

Visitors Protected

Our 100 per cent eye protection requirements extend to all visitors—sales engineers, school and club groups, employees of contractors—anyone working or moving about inside the plant areas. In fact, one of our outside contractors recently discharged a foreman for failure to comply with the regulation in our plants.

Have our efforts paid off? We are most proud of the fact that 1952 and 1953 have been the finest years in our division's history from the standpoint of safety. Vision conservation efforts have made an important contribution to that record.

Cooperation with Schools

In any community such as Anderson one of the penalties of being industrially big is that you establish through leadership and example a pattern by which the rest of the community must be measured. For several years we have been very active in all community safety projects. In 1945 while working with the driver education department of our junior and senior high schools we learned that a large percentage of the students failed to pass their final tests because of defective vision. We quickly worked out a program with the school authorities and professional eye men and began a visual screening program at the start of each school term for all students enrolling in driver education. Delco-Remy provided the screening equipment and with the assistance of an optical company technician taught the school nurses how to operate it. We also assisted in the follow-up of cases so that the students would get the utmost benefit.

The following year, 1946, the benefits were so obvious that the school officials and the professional eye men suggested that we extend these services to all students in the vocational schools. We elected, however, to include all students in both junior and senior high, approximately 3,800. We continued at this level in our schools

for the next three years. It then became apparent that we were by-passing the school children who perhaps were in greatest need of visual care, those in the elementary grades. In order to service our 10 elementary schools in Anderson we obtained more testing devices and more registered nurses and extended those services to all students in our public schools from the fourth grade through the twelfth, including approximately 9,000.

Service Clubs Share Cost

When it was realized that some parents could not afford the necessary professional eye care for their children two service clubs made available $1,000 each for this purpose. The administrative school nurse approves all disbursements from these funds, after careful investigation. So far the $2,000 has been more than sufficient to meet such needs each year.

Among senior high students 14 to 18 years of age it is found that 19 per cent are in need of further visual service. In all other age groups 14 per cent need professional eye care.

It naturally followed that better eye protection was required for all students in the vocational schools. Again industry accepted this responsibility and helped to provide the proper types, with personalized fitting for all students. Assistance was also given to several of the teachers and students who needed corrective safety eyewear.

Anderson now has what we believe to be one of the finest vision conservation programs among all public school systems. The faculty has been eloquent in praise of it and certainly is most appreciative of industry's guidance. Other school boards within a radius of 100 miles have asked our local officials how such a program originated and developed. There is just one apparent answer: Establish leadership through industry or find a Joe Doakes who will volunteer such leadership in the community.

Our school system holds a charter in the Wise Owl Club, and many other cities in Indiana will rapidly follow this example, since our promotional plans are directed to this end. I should like to suggest that in large metropolitan areas where there are many schools it is wise to get a sponsoring industry for each school. Such industries must of course have established leadership in the field of accident prevention.

General Recommendations

Following are some general recommendations that apply to the conduct of industrial vision conservation programs:

Large industries in small communities should permit all professional eye people to retain their industrial patients and share alike in the program.

Any industry desiring to institute a complete vision conservation program should employ all of the known and proven methods such as: screening devices, lensometers and other instruments for evaluating corrective lenses, ascertaining hardness pattern, determining base curves, etc. Drop ball tests, salt pots and other special repair tools and parts are all most necessary for a proper program. Individual fitting of all eyewear whether plano or prescription should be done by thoroughly trained personnel. A good sterilization program with individual packaging before reissue is a must.

A program such as outlined here will exert broad influences in all places of employment within the commu-

nity. Most industrial organizations in our city have followed the example of Delco-Remy. Within the past four or five years other plants have been faced with the miring down of contract negotiations until their management agreed to adopt the same eye protection measures that were so effective at Delco-Remy. We have assisted in setting up these programs, again providing the necessary professional skills.

Finally, may I personally recommend the Wise Owl Club as one of the finest promotional tools—effective in installing, developing and sustaining a good sight conservation program. Even in plants that have 100 per cent eye protection programs of long standing management is coming to look upon the club as a valuable safety incentive. For those organizations either in industry or the vocational field that are striving to develop a good eye protection-correction program the Wise Owl Club has greatest value. It does so much for so little.

Haste Defeats Purpose

When an eye protection program is instituted on a hasty, improvised basis, accidents continue and even increase, says R. F. Brimmer in an article "Can Your Eye Program Take It?" appearing in *Safety Maintenance and Production* for April 1954.

Mr. Brimmer presents a group of case histories illustrating the need for basic research and careful planning to fit the individual situation before installing a protective program. For example, one man, employed in a chemical plant whose production operations were largely concerned with receiving, repackaging, and shipping concentrated acids and caustics, was pouring a caustic from one receptacle to another, when suddenly a flash from the mixing precipitated the material into his eyes. At the end of four months of treatment he was declared industrially blind in one eye, and had considerably impaired vision in the other. In this case good engineering and design could have resulted in an almost completely enclosed operation with minimum handling by hand.

Job analysis, relation of visual acuity to the job, design and engineering of processes, selection of protective equipment, instruction of personnel, and enforcement of the program are all emphasized by Mr. Brimmer as necessary in initiating and maintaining a good eye protection plan.

Dime Store Glasses

A bill proposed to end New York's 26-year ban on the sale of ready-to-wear corrective spectacles "died" on March 9th by a vote of 12 to 1 of the education committee of the New York State Assembly. The bill was introduced by Assemblyman William E. Brady, of Greene County, who is chairman of the education committee. For the fifth consecutive year the committee voted against favorable consideration of Assemblyman Brady's bill.

Over-the-counter sale of glasses is a serious threat to the vision and eye health of thousands of people in the middle and older age groups. Medical authorities attribute at least 50 per cent of all blindness to neglect. Sale of mass-produced glasses without prescription increases the likelihood of such neglect. Defective vision may herald serious eye or body disease which can be detected only by a professional examination.

RESEARCH NEEDS RELATED TO PARTIALLY SEEING CHILDREN

A report of the Committee on Education of Partially Seeing Children, one of the standing advisory committees of the National Society for the Prevention of Blindness.

PUBLIC school facilities for partially seeing children in the United States were established 40 years ago. During the first 30 years there was a rapid growth in the number of educational programs serving partially seeing children, but practically all of these were initiated and carried out in the highly populated urban areas. Partially seeing children in rural areas received little attention and service.* Even in the urban areas, during the last ten years, there has been a slow but steady decline in the number of children enrolled in existing facilities despite the probability that the number of partially seeing children of school age has increased with the overall increase in the school-age population.

Why has this downward trend in enrollments developed? Have programs for partially seeing children kept pace with the changing trends in general education? How can school systems make better provisions for all partially seeing children?

As the movement to educate partially seeing children in public schools advances toward its 50th anniversary, it is desirable to pause long enough to answer these and other fundamental questions and to devise scientific means of obtaining logical and objective solutions to them. This is the function of research.

The many problems attendant upon developing new programs, devising special educational equipment and materials, establishing techniques for selecting and educating special teachers, and effecting community interest and cooperation have up to now overshadowed the needs for basic research related to partially seeing children. It is the purpose of this report to point up briefly some of the research projects of immediate concern to those who have responsibility for their education, health, and welfare.

Statistical Problems

For many years the estimate of one partially seeing child in 500 of the school-age population has been used in planning educational facilities and school medical services. This ratio was determined from data obtained in

* Meeting the Needs of Partially Seeing Children in Rural Areas. 1952 Report of the Committee on Education of Partially Seeing Children. SIGHT-SAVING REVIEW, Vol. XXIII, No. 1, Spring, 1953, p. 21–27.

sampling surveys carried out in several cities about two decades ago, at a time when the definition of a partially seeing child differed from that now commonly accepted.* There is need for widespread, periodic, regional surveys, involving rural as well as urban areas, in order to prove or disprove the accuracy of the one-in-500 ratio, using the new definition.

Accurate data on causes of partial sight in children were tabulated for the first time on a nationwide scale in 1951.† If trends regarding distribution and concentration of various types of eye defects and differences in placement procedures are to be established, similar nationwide studies should be undertaken on a planned, cyclical basis, preferably every third or fourth year.

On-going basic statistical studies of the kind described can probably be accomplished most satisfactorily under the supervision of a national agency equipped to handle the extensive correspondence, detailed analyses, impartial publication and interpretation of findings.

Medical Problems

Standards for referring partially seeing children to special services are usually based upon distance visual acuity ratings. Although this information is of major importance in determining many of the child's adjustment problems, it is not adequate for the specific planning of his educational program. Since near vision is used in many school activities, the partially seeing child should be given tests to ascertain the size of type that can be read consecutively for fifteen to twenty minutes with the material held at *what is for the child* the most comfortable focal distance. Experiments in this area should be so designed as to give the child some margin for comfortable seeing.

A preliminary experimental study of the near visual acuity of about a hundred partially seeing children was carried out recently by the Division of Special Education, Ohio State Department of Education. Although prolonged follow-up is essential in establishing conclusive results, the findings of this study indicate that the majority of the children tested had near visual acuity good enough to enable them to use reading materials of standard size for their age-grade levels. These tentative findings show the need for an extensive controlled study of the near visual acuity of partially seeing children with varying types of eye defects. If the results should confirm those obtained in Ohio, there would appear to be a sound basis for changing many of the approaches hitherto deemed necessary in educating the partially seeing.

Related to this problem is that of the fitting and use of special optical devices, such as telescopic lenses. Even if only a small percentage of partially seeing children can use these with benefit, all who could possibly profit from their use should be given adequate trial under continued guidance.

* Partially seeing children fall into two main categories: Those who have a distance visual acuity of 20/70 or less in the better eye after the best possible correction and who can still use sight as their chief channel of learning; and those who, in the opinion of the eye specialist, can benefit from either temporary or permanent use of appropriate special facilities.

† Kerby, C. Edith. A Report on Visual Handicaps of Partially Seeing Children. Exceptional Children, Vol. 18, No. 5, February 1952, p. 137–142.

A study of eye defects by type and degree should also be undertaken to ascertain precisely their effect on each of the visual functions before and after compensation with both appropriate ordinary lenses and special optical aids. This might provide a more satisfactory basis for selecting the children who need help, as well as objective information on both the usefulness and limitations of compensating devices.

Social and Psychological Problems

Many statements have been published relative to the effects of handicapping conditions on the social and emotional development of partially seeing individuals; these statements need to be substantiated by evidence from controlled research studies.

Why do so many partially seeing children remain in regular classrooms even when special facilities are readily available to them? Are socio-economic and emotional factors correlated with parental acceptance or rejection of placement in special facilities? Is travel distance to centers isolated from the child's own social group a factor? Do the kind and amount of counseling and guidance provided by ophthalmologists, social workers, nurses, and educators influence parental decisions and attitudes? To find the answers a thorough analysis of the many factors affecting placement is needed.

A correlative study of the most effective procedures for ascertaining mental and vocational aptitudes and personality profiles of partially seeing children is one of the major research priorities. Only a beginning has been made in adapting testing methods to these children, and controlled studies in this area are greatly needed.

After adequate standard testing instruments have been developed it will be possible to apply them in studies designed to measure objectively the effects of various educational methods upon the emotional, social, and vocational adjustment of partially seeing children. A comparative analysis of the special class and regular class approaches to educating them is needed immediately so that, as educational facilities expand, the most effective procedures may be introduced. Such an analysis should place major emphasis upon those factors affecting the total adjustment of the child.

To what extent is the special program of the school related to and integrated with home and community services? Is the decline in use of existing facilities due in part to the failure to interpret the school's program adequately to parents and to the community? Is the lack of programs in rural areas related to inadequate coordination of existing resources? Basic field research projects in several geographic areas are needed to obtain data pertinent to these pivotal problems.

Community studies require application of the interprofessional teamwork approach. Physicians, social workers, nurses, educators, psychologists, and other personnel of voluntary and official agencies all have important roles to play in surveys and studies centered around partially seeing children. A pilot study using the various professional interests as a team to study the health, education, and welfare aspects of a community program for the partially seeing could make a telling contribution and would be of invaluable assistance in developing effective methods for long-range planning.

Educational Problems

All the problems discussed in the preceding sections have direct implications for the development of sound educational programs for partially seeing children. Indeed, until the answers to many of the questions raised are known, educational management of the partially seeing under any plan cannot be based on objective data but will continue to rely on the subjective opinions of those involved in planning and operating the programs. In addition to the fundamental problems already indicated, there are others related specifically to pedagogical aspects of community programs.

The teacher occupies a position of central significance in any educational program. In cooperative programs of the kind recommended for partially seeing children,* the special teacher and the regular classroom teacher must work together continually on a planned basis if the individual needs of partially seeing children are to be met adequately. Several urgent research problems relate to the roles of both the special and general classroom teacher:

1. How much assistance and what kind of assistance does the classroom teacher need if she is to integrate the partially seeing child thoroughly into all teaching-learning activities?
2. How can this assistance best be provided? By whom?
3. From what kinds of supervision can the classroom teacher profit most and by whom should this supervision be provided?
4. Does the work of the special teacher of the partially seeing overlap and duplicate that of the regular classroom teachers? Or is it truly supplementary and complementary to the program of the regular grades?
5. Does each partially seeing child actually receive the individual attention and adjustments demanded by his specific eye condition?
6. Does the special teacher understand fully the educational and personal implications of the child's eye difficulty and does she interpret them adequately to the regular classroom teachers?
7. Does the provision of special facilities for students at the high school level prevent them from "dropping out" before they complete the high school program?

To answer these questions, thorough job analyses need to be done in several types of educational settings: in the traditional special class for the partially seeing, in "regular class," and in itinerant-teacher programs for partially seeing children.*

Concomitant with field studies of job analysis there should be developed in two or three universities experimental programs for educating teachers of the partially seeing. These programs should be based on realistic considerations of the many skills and varied knowledge needed by teachers if they are to organize and operate

* Education of Partially Seeing Children. 1951 Report of the Committee on Education of Partially Seeing Children. SIGHT-SAVING REVIEW, Vol. XXII, No. 1, Spring, 1952, p. 2–6.

* The regular class plan differs from the traditional special class plan in enrollment and movement of children. In the first plan the child is enrolled in his regular grade and goes to the special classroom for all necessary close eye work. In the traditional class plan the child is enrolled in the special class and goes to the regular class for participation with the normally seeing in those activities and recitations which do not require close use of eyes.

effective programs of the several different types that may be necessary to reach all partially seeing children in a given geographic area. Continuous, objective evaluation should be an essential aspect of these experimental teacher education programs to assure the institution of changes and modifications whenever field studies and educational research indicate the desirability of developing new techniques and philosophies. Supervisors of special education at the state and local level should be involved in the planning, developing, and evaluating of university programs of this type.

Coordination of elementary and secondary school programs for partially seeing children has been a major problem, especially in those areas that have utilized the "sight-saving" class approach. Exploratory research would serve to discover the underlying factors relevant to this lack of educational coordination, wherever it exists, and to relate these factors to others affecting the program as a whole.

Until objective, comprehensive data on the near vision of partially seeing children are available, there is no accurate basis for determining the overall need for materials printed in larger than average type size. Since reproduction of such special materials is very costly, it is not economically feasible, in view of the limited sales possibilities, to publish a large number of titles in any single subject matter area or for any specific age-grade level. If the needs of partially seeing children who cannot read standard materials are to be met, magnification devices must be developed and evaluated in carefully controlled field tests using children with many types of eye defects. A satisfactory magnifier would make it possible for several thousand partially seeing children to utilize the same study materials being used by their normally seeing companions. This would prove to be not only an economy but also a means of reducing feelings of difference between partially seeing pupils and their normally seeing classmates.

Summary and Recommendations

The objective of this committee report is to present some problems that lend themselves readily to study with research techniques and that should have high priority in a long-range research program related to partially seeing children. Obviously, the list presented herein is not complete nor has any attempt been made to develop details of research design, since the form taken by any research project or study is dependent upon many factors, not the least of which is the specific variable (or variables) to be controlled.

The members of the Committee hope that this brief overview of needs will stimulate professional workers to undertake research in this important area of special education and that it will provide a challenging basis for selection of significant problems. It is recommended that the National Society for the Prevention of Blindness cooperate with and lend assistance to other organizations and individuals planning research in this field.

Since many of the suggested projects will require substantial research budgets and qualified professional supervision over an extended period of time, the Committee recommends that the National Society for the Prevention of Blindness take the initiative in developing appropriate project outlines to

be submitted to foundations interested in research related to children. It is recommended further, if suitable grants are thereby obtained, that the National Society serve as supervisory and coordinating agency for research projects supported by these grants in order to prevent needless duplication of effort and to assure consistent liaison between the persons or institutions engaged in conducting the studies and the foundation representatives providing the funds.

Respectfully submitted:

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Class Projects

Mrs. Marian M. Lee, who teaches at the Randolph School in Asheville, North Carolina, reports that her class of partially seeing children wrote and performed a play called "Edison, Lamp Lighter" on radio station WLOS, Asheville, February 6th. Ten students participated. The script dealt with the boyhood of Thomas Alva Edison, "who perfected the incandescent light so that the whole world might be lighted."

The class took Mrs. Lee to the airport on March 9th, when she left Asheville to attend the NSPB Annual Conference in St. Louis. To prepare for this trip the children studied about the Wright brothers and read other stories of airplanes.

QUOTES FROM ICEC

Dr. Samuel R. Laycock, speaking at the 32nd Annual Convention of the International Council for Exceptional Children: "In the education of exceptional children, as in the education of all children, it is the public who in the last analysis determines educational policies and provides educational equipment. In the education of exceptional children it is as true as in general education that only the public can improve the schools."

Mrs. Hazel C. McIntire, before the same convention: "What is the responsibility of the school? As this question comes to me sometimes the tone of the voice sounds as if the question means: 'How much am I required by law to do?' Other times the tone of voice says: 'How far can we go in providing service?' One question asks: 'How can I get help in keeping James in school?' The other: 'How can I legally get rid of this problem?' One seeks legal understanding with his mind. The other seeks a fuller understanding with his heart and mind."

Symposium Sets Standards for Education of Partially Seeing

A REPORT of the four-day College Symposium on the Education of the Exceptional, held at Hunter College of the City of New York in February 1952 has recently appeared. The participants, who convened from many colleges and organizations, were organized into 12 work conference areas dealing with the education of physically, mentally, or emotionally handicapped children, and with the education of the intellectually gifted.

Following are the recommendations of the work conference on the partially seeing:

1. Many states cannot establish modern programs for educating partially seeing children, even though they are ready and willing to do so, because existing legislation is too restrictive. This is especially true of the ways in which reimbursement is made to local boards of education for services rendered to physically handicapped children.

Therefore, we recommend that existing legislation pertaining to the education of all physically handicapped children, including the partially seeing, should be re-examined in the light of recent educational philosophy and psychology. If the laws are not flexible and inclusive enough to allow for the development of modern, acceptable programs, measures should be taken immediately to amend the legislation.

2. At present there are facilities for partially seeing children in 37 states and two territories. Yet in 20 of these there are no certification requirements for teachers of the partially seeing.

Therefore, we recommend that all states employing teachers of the partially seeing should set up minimum certification requirements. Our committee recommends for all teachers of partially seeing children the following minimum essentials for certification: A well-integrated personality; normal vision or vision correctable to normal (20/40); bachelor's degree from an accredited teacher preparation institution, and a teaching certificate for the grade level at which the teacher intends to teach; minimum of three years of successful teaching experience with normally seeing children; minimum of six semester hours of graduate work in the special field as outlined in the body of the report.

3. High-calibre graduate training of the kind recommended in this report can be obtained only in urban centers with concentrations of specialized medical, clinical, and educational facilities.

Therefore, we recommend that at least six to eight regional centers for preparing teachers of the partially seeing be developed and maintained.

4. We recommend that partially seeing children should not be educated

in schools for the blind, and this for several reasons: Methods and materials used in teaching partially seeing children are entirely disparate from those used with the blind; in schools for the blind partially seeing children will not have regular contact with normally seeing companions with whom they will later have to compete on an equal basis throughout their entire lives; and institutionalization has an adverse effect upon the emotional and social growth of children.

Therefore, we strongly recommend that all partially seeing children be retained in their own homes and communities and that local educational authorities accept responsibility for providing acceptable programs to meet their needs. This is in line with one of the major recommendations issued recently by the White House Conference.

5. We recommend that orientation courses in special education be introduced into the curriculums of teacher education institutions throughout the country and that a general course be made compulsory for all prospective teachers, principals, superintendents and supervisors. This basic required orientation course should include a strong unit on the education of partially seeing children and care should be exercised to insure that the material contained in this unit is up-to-date and authentic.

6. With the steady reduction in the numbers of partially seeing children enrolled in existing classes, preparation of teachers in traditional patterns alone can no longer be justified.

Therefore, we recommend that recruitment activities in this area should not be extended until such time as approved courses for preparing teachers of the partially seeing incorporate new acceptable approaches.

7. We recommend that plans be devised for placing more emphasis on the development of effective on-going, in-service programs, designed to provide professional growth for teachers of the partially seeing. This program should include:

Periodic refresher courses and workshops dealing with the problems of partially seeing children; contacts with other professional personnel including ophthalmologists, voluntary and official agencies; school health workers, orthoptists and others; constructive supervision; wide professional reading; inter-school and inter-agency visitations; practical research; participation in community activities; and membership in professional organizations and attendance at professional meetings.

8. In order to plan realistic, long-range programs for educating the partially seeing, it is necessary to know the number and location of all children needing services.

Therefore, we recommend that more attention be given in schools throughout the country to case-finding activities. All children should be given a vision test upon entering school and annually thereafter, and adequate follow-up procedures should be instituted. This means that all community resources should be pooled to provide an effective outcome.

Note: The complete report of the symposium is available from Hunter College at 695 Park Avenue, New York 21.

Next Year's NSPB Conference
March 16, 17, 18, 1955
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NOTES AND COMMENT

• Citation to Dr. Perry

The President's Committee on Employment of the Physically Handicapped inaugurated a citation for outstanding service in 1953, and has honored 16 physicians and surgeons to date. Among these outstanding physicians is Claude S. Perry, M.D., of Columbus, Ohio, ophthalmological consultant of the Ohio Division of Social Administration. Dr. Perry has been prominent in the passage of Ohio laws beneficial to saving the sight of newborn infants. Through his knowledge and skill the vision of many clients of the Vocational Rehabilitation Service has been fully or partially restored, and he has counselled with and advised the students regarding job choices and vocational training. In World War II during the Battle of the Bulge, Dr. Perry developed a prosthetic eye implant for which he received the Bronze Star. Dr. Perry is a consultant ophthalmologist for the National Society for the Prevention of Blindness.

• Television for School Children

According to the joint committee on health problems in education of the National Education Association and the American Medical Association, television will not injure normal vision provided the following conditions are met:

The set must be the right size for the room, usually a 16-inch or larger screen; the viewer should be not closer than 10 feet from a 16-inch screen; the set should be located against a light colored wall and illumination at night should be from shaded lamps six to eight feet on either side of the screen; the room should be partially darkened for daytime viewing.

Periods of study, work, play, meals, television viewing, and other activities should be arranged so that television will not occupy a prolonged time. The committee believes that television holds great potentialities for the education of children and youth.

The above resolution and others of the joint committee appear in the May 1, 1954 issue of the Journal of the American Medical Association.

• Dangerous Glasses

Use of tinted glass in automobiles is dangerous because it decreases visual efficiency in night driving, in the opinion of Dr. Paul W. Miles, whose article entitled "Visual Effects of Pink Glasses, Green Windshields, and Glare Under Night-Driving Conditions" appeared in the January 1954 issue of *A.M.A. Archives of Ophthalmology.*

"Particularly unfortunate is the popular selection of pink for the glasses and aquamarine green for the windshields. While pure red and pure green filters may be quite transparent, in combination they are opaque," Dr. Miles states. The green windshield came into being because large areas of

glass let in too much heat from the sun. Red and infra-red rays which carry heat are cut out by a green filter. However, since almost two-thirds of headlight energy is concentrated in the red end of the spectrum and only one-third is in the range to which a green windshield is most transparent, this windshield color is the worst possible selection for night driving, Dr. Miles pointed out.

Visual acuity at night is markedly decreased by the use of tinted glass. Normal visual acuity of 20/20 is reduced to 20/32 through colorless glass, and to 20/34 through light yellow glass. Pink glass results in 20/40 vision; green windshield glass in 20/46. The combination of these decreases normal vision to 20/60. "Even more damning is the effect of tinted glass on resolving power during night driving," Dr. Miles wrote. "A pair of objects which would appear separate at 100 feet through a clear windshield would appear single through a green windshield until the distance had decreased to 25 feet."

Green windshield glass is acceptable only if it is applied as a separate layer to be moved aside for night driving. Persons with defective vision, including the common type of color blindness, should be advised to add auxiliary headlights to their automobiles and to avoid any type of tinted glass for night driving.

• School Health Advisers

At its March 1954 meeting the New York State Board of Regents established a new advisory council on school health services. Among the members elected for a term of two years beginning January 1, 1954, is Dr. Franklin M. Foote, executive director of the National Society for the Prevention of Blindness.

The principal programs of the Bureau of Health Services are the supervision of annual medical examinations performed by approximately 1,250 part-time school physicians, and the work of 1,232 full-time school nurse-teachers and 420 full-time dental hygiene teachers. The conservation of vision and hearing are also major programs of the Bureau.

• $100,000 for Eye Loss

According to news reports a Supreme Court jury of nine men and three women in White Plains, New York, awarded $100,000 damages to 12-year-old Bonnie Jane Wilson of New Rochelle, who lost her left eye three years ago while playing on property of the city of New Rochelle. Her father was awarded $5,000. The little girl's eye was irreparably injured when an unidentified object struck it.

• Insured Spectacles

In the first case of its kind to come before the local courts in Vancouver, B. C., the parents of a 10-year-old boy recently were authorized to accept $5,000 offered by the Imperial Optical Company for the injury received by their son, who was hit in the eye by a BB shot last July. The case is reported in the *Optical Journal and Review of Optometry*, March 15, 1954.

The boy, wearing spectacles with Hardex lenses purchased the previous October, was playing behind his home when the accident occurred. The spectacles carried insurance of $5,000 for one year against the wearer's being injured by the breaking of the lenses. When the BB shot hit the lens a sliver of glass pierced the boy's left eye.

LAURENCE B. ELLIMAN, JR.

Laurence Bogert Elliman, Jr., Manhattan real estate executive and a member of the National Society's Board of Directors, died following a fall in his home at Lattingtown, L. I., on March 31. His untimely death at the age of 45 was a profound shock to all who served with him in the cause of blindness prevention. For a number of years he had rendered invaluable service in connection with the Society's administrative affairs and general program.

Mr. Elliman was vice-president of Pease & Elliman, Inc., having been associated with the company founded by his father since graduating from Princeton in 1931. He was a major in the Army Air Forces during World War II. He had been a director of Manhattan Eye, Ear & Throat Hospital since 1936.

JOHN L. FORTSON

John L. Fortson, executive director of the Connecticut Association for Mental Health, Inc., and former director of information service for the National Society, died suddenly of pneumonia in Grace-New Haven Community Hospital, Connecticut, on April 23 at the age of 41. Mr. Fortson left the Society sixteen months ago to join the health group with headquarters in New Haven. He was successfully directing its expanding program when he was stricken with pneumonia and died after a few days' illness.

A native of Tecumseh, Oklahoma, Mr. Fortson was graduated from the University of Oklahoma in 1934. During World War II he was a lieutenant commander in Naval Air Intelligence.

Mr. Fortson was formerly national director of public relations for the Federal Council of Churches; was with the United Press for a period; and with the N. W. Ayer agency in New York. For the last several years he had conducted a course in public relations at Columbia University. His many friends on the Society's staff have been saddened at his passing.

LeGRAND H. HARDY, M.D.

Dr. LeGrand Haven Hardy, one of the nation's eminent authorities on the physiology of the eye, died of a heart ailment in New York on April 14 at the age of 59.

Dr. Hardy was clinical professor of ophthalmology at the College of Physicians and Surgeons of Columbia University and associate attending ophthalmologist of Presbyterian Hospital at the time of his death. He is widely known for his research and publications in the field of color vision. His most recent included a final report on his work for the Office of Naval Research entitled "The Geometry of Binocular Space Perception."

Dr. Hardy was a pioneer in this country in the treatment of functional eye disorders and in 1932 opened the first clinic in the United States for the treatment of cross eyes by means of exercises and the use of stereoscopic instruments, many of which he himself developed. He had been president of the American Orthoptic Council since 1938.

For more than a score of years Dr. Hardy served as adviser to the National Society for the Prevention of Blindness. The great benefits of his knowledge and guidance, so generously given, and his warm friendship will be sorely missed.

AROUND THE WORLD

ENGLAND

Visual Standards for Motorists—Recommendations on the medical standards and examination of drivers of public service vehicles, trucks and private cars were recently made by a subcommittee of the Occupational Health Committee of the British Medical Association. The committee, appointed to examine medical standards required for drivers and railway and air transport operators, consists of 13 members, including at least one ophthalmologist.

In cases of diminished visual field the committee believes that the opinion of an ophthalmologist as to fitness to drive should be obtained, even though central visual acuity is satisfactory. When visual acuity without glasses is poorer than 6/12 in one eye and 6/36 in the other the driver's record should bear the limitation, "spectacles must always be worn when driving." In addition, the committee recommends that a spare pair of spectacles be carried for long distance driving. In public passenger conveyances a standard well above the 6/12, 6/36 visual acuity is highly desirable to allow for possible future deterioration of vision.

The vision of public transport drivers should be tested every five years, and the committee recommends that a minimum standard be set of corrected vision of 6/9 in one eye and 6/24 in the other. Persons with monocular vision should not be recruited for public service of heavy goods vehicles, the committee believes, but an experienced driver whose vision in one eye has gradually failed should not necessarily be prohibited from driving.

Since persons with defective color vision are generally able to distinguish between traffic signals by means of their positions, the committee does not recommend curtailment of their driving. They suggest, however, that the green light contain a strong blue component since about four per cent of men are red-green defective. The possibility of a different shape for the red and green signals might be considered if proof is forthcoming that accidents are caused by inability to distinguish between traffic lights.

Health Service Spectacles—A London newspaper reports that in 1953 under Great Britain's National Health Service, less than one per cent of the 3,352,000 persons who ordered spectacles had to be reminded to collect them. About half of these persons, 16,500, did not get their spectacles even after being reminded that they were ready.

FINLAND

Heparin for Ocular Diseases—Dr. Salme Vannas of the University Eye Hospital, Helsingfors, has been investigating the use of heparin in treating eye diseases. He reports that heparin ointment and drops are effective in preventing clotting in the anterior

chamber of the eye in experimental iritis, and in prolonging the rate of coagulation in both aqueous humor and blood. Dr. Vannas hopes to be able to distinguish between rheumatic and tuberculous diseases of the eye by means of heparin tolerance tests. Experience with five patients with arteriosclerotic retinopathia indicates that in these otherwise hopeless cases heparin may help protect the good eye if medication is begun early. Heparin was given in small intravenous doses to patients with arteriosclerosis. The work was published in *Nordisk medicin*, November 12, 1953.

FRANCE

Ophthalmology Congress—The 60th Congress of the French Society of Ophthalmology was held in June 1953 under the presidency of Dr. A. B. Reese of New York. The large number of foreign participants gave the meetings an international flavor.

Dr. A. Dollfus discussed glioma of the retina, pointing out that 62 per cent of these tumors occur in children under three years of age, and 21 per cent of the patients have the tumor in both eyes. Dr. Reese reported that 11.5 per cent were cured by roentgen therapy, and Dr. Stallard of London reported cures in 20 per cent by using radon seeds.

INDIA

Land of Ocular Diseases—The experiences of Dr. William C. Caccamise as a missionary physician in India have verified the world-wide reputation that India is the "land of ocular diseases and cataract surgery." His work in a free eye clinic 340 miles northwest of Calcutta in the district of Bihar is reported in the April 15, 1954 *Modern Medicine* feature, "A Medical Odyssey."

The Kurji Eye Clinic caters to a population of over 30,000,000 living in an area the size of Illinois. The patients brought their own bedding and slept on pieces of plywood and straw mattresses. The nursing burden was relieved by the Indian practice of bringing one's own attendant when admitted to a hospital. The prime purpose of the clinic was to offer free diagnostic and treatment facilities.

Well over 50 per cent of the clinic patients are found to have trachoma. Smallpox scars and xerophthalmia due to malnutrition are common. Cataracts are apparently becoming more common. Since there are few physicians performing eye surgery, and precaution against postoperative infection during the summer and monsoon months limits operation almost entirely to the winter, the Indian eye surgeon must stress quantity in his work. Some ophthalmologists have extracted as many as 250 cataracts in one day. The Indian eye surgeon, by using only cocaine drops for anesthesia and dispensing with all sutures, is able to perform a cataract operation in one to two minutes. Dr. Caccamise saw an average of 150 patients and performed an average of 10 cataract extractions in a 12-hour day. Each operation required 20 to 30 minutes. Couching, or pushing the opaque lens into the posterior lower portion of the eyeball, is still practiced in outlying villages in India. Two blind victims of this process, whose eyes reacted to the luxated lens, sought aid at the Kurji Eye Clinic.

Dr. Caccamise feels that through education and public health much eye disease can be eliminated. Among

more than 1,200 boys and girls studying at mission schools examination failed to reveal a single case of infectious or malnutritional eye disease, indicating the results of proper care.

PHILIPPINE ISLANDS

Psychosomatic Ailments—Many eye conditions and symptoms defy explanation in terms of optics, anatomy, physiology, pathology, or somatic medicine, according to Dr. Geminiano de Ocampo's article in the February 1954 *Journal of the Philippine Medical Association*. Some of these, however, can be understood, explored and managed by considering their psychosomatic background.

Dr. de Ocampo invites thought on this phase of ophthalmology and points out the following as suspect of a psychosomatic patient: inconsistencies in complaints, manner, behavior, history, and physical findings; exaggeration, conscious or subconscious, or vagueness of ocular complaints or reactions; multiplicity of complaints, glasses, and doctors; uncooperativeness; psychosomatic appearance or complaints; changeable findings in retinoscopy, muscle testing, subjective refractions, etc. It is emphasized that ophthalmologists should know how to detect a psychosomatic patient, and, time permitting, should develop the inclination and knowledge to handle them before referral to a psychiatrist.

Among the true origins of psychosomatic complaints, Dr. de Ocampo has observed marital unhappiness, family resentments, frustrations or pressures in business or career, political tension disappearing after elections, fear of blindness, dislike of glasses, and lack of emotional gratification.

New Detroit Ordinance Provides for Junior Rifle Clubs

A new BB-gun ordinance became law in Detroit on March 8, after intensive work by the Detroit Society for the Prevention of Blindness in cooperation with the city's Council of Parent-Teacher Associations. The new ordinance, recommended by the National Rifle Association, provides for the formation of junior rifle clubs under adult supervision. This replaces a former ordinance completely "outlawing" BB-guns for children under 18. Although the "outlaw" ordinance had been in effect since 1943, the Detroit Society reports that "there were increasing numbers of serious eye injuries" due to BB-guns. The Society then helped sponsor a new ordinance providing for junior rifle clubs.

A new pamphlet, "For Home Accidents," has been published by the Detroit Society. It is intended as a guide in handling accidental injuries if they should occur in the home. Brief directions are given for proper care until skilled help is available. The attractive booklet is thumb-indexed for quick reference; price 17 cents. Quantity mail orders may be sent to the Society at 1401 Ash Street, Detroit 8, Michigan.

Also just issued by the Detroit Society is a bookmark bearing a picture of a friendly, smiling bookworm who says, "I wormed my way into this book—not for any idle look—but to see that you see better, every line and every letter. YOUR eyes are gifts entrusted to you; fail them not; they will not fail you." Rules for proper reading habits are featured on the bookmark. Information as to quantity prices may be obtained at the above address.

CURRENT ARTICLES

Retrolental Fibroplasia and Oxygen Therapy. J. T. Lanman, L. P. Guy, and J. Dancis. *Journal of the American Medical Association.* Vol. 153, p. 223. May 15, 1954.

Eighty-six infants weighing between 1,000 and 1,850 grams at birth, admitted to the Bellevue Hospital Premature Nursery when they were less than 12 hours old, were assigned in order of admission to one of four groups: (1) with high oxygen concentration averaging 69 per cent; (2) with high oxygen concentration plus oral estrogen therapy; (3) with low oxygen concentration, receiving oxygen therapy of less than 40 per cent only for cyanosis; (4) with low oxygen concentration plus oral estrogen. Estrogen was given as replacement therapy because the premature infant is denied a maternal source of estrogen during the period when retrolental fibroplasia appears. Mortality and incidence of retrolental fibroplasia, however, were not influenced by estrogen administration, and therefore, estrogen supplements were disregarded in analyzing the effects of oxygen.

All groups received identical care, remaining in incubators for two weeks or until a weight of 1,500 grams was attained, whichever was longer. Funduscopic examinations were made once weekly during the stay in the premature unit. A final examination was made after the age of three months.

Twenty-one infants died before the age of three months, and one infant in the low oxygen group, whose eyes were normal at 41 days of age, disappeared after discharge. Among the remaining 64 infants 36 were in the high oxygen group and 28 in the low oxygen group. Retrolental fibroplasia in the vascular stage was noted in 22 infants (61 per cent) of the high oxygen group, and two infants of the low oxygen group (seven per cent). Eight of the 22 infants in high oxygen with vascular lesions developed cicatricial retrolental fibroplasia. The two infants in restricted oxygen who developed vascular changes regressed to normal.

Infants were considered to have retrolental fibroplasia in the vascular stage if one or more of the following signs appeared after the tenth day of life: vascular dilatation of at least twice the normal diameter; vascular tortuosity; retinal or vitreous hemorrhage. Although reversible vascular stage lesions occurred in both groups, the frequency in the high oxygen group was nine times as great as in the low oxygen group. With the exception of infants dying of causes unrelated to oxygen therapy, the mortality rates in both groups were the same.

The authors believe that retrolental fibroplasia is directly related to excessive oxygen supplements. It can be controlled by severely restricting oxygen administration to premature infants. At the Bellevue Hospital Premature Nursery only definitely cyanotic infants are given oxygen, and then at measured concentrations of less than 40 per cent. Frequent attempts are made to discontinue such therapy, which usually lasts from a few minutes to a few hours and is not resumed

except for recurrent cyanosis. Aerosol therapy is given to noncyanotic infants with compressed air.

Preparation and Maintenance of Sterile Ophthalmic Solutions. F. H. Theodore and R. R. Feinstein. *Journal of the American Medical Association.* Vol. 152. p. 1631. August 22, 1953.

At present governmental regulations control the manufacture of commercially prepared sterile ophthalmic solutions. An educational program regarding noncommercial compounding of such preparations has been begun in cooperation with the National Society for the Prevention of Blindness.

The organism most frequently responsible for infection from contaminated ophthalmic solutions and ointments is *Pseudomonas aeruginosa*, a Gram-negative bacillus which may cause serious corneal ulcers. Gram-negative bacilli of the genus *Proteus*, capable of causing serious corneal infections, have been found as contaminants in methylcellulose solutions. The only common Gram-positive ocular pathogens found to cause drug contamination are *Micrococcus pyogenes var. aureus*, species of *Streptococcus*, and *Diplococcus pneumoniae.* Care must be taken to prevent air contamination of drugs used in ocular surgery or in treating injuries of the eye. The only pathogenic fungus to be considered is *Aspergillus fumigatus.* Although molds do not cause ocular infections, their presence in eye solutions is dangerous because they accelerate deterioration of the active drugs. Contamination of solutions by viruses of ocular significance has not been known to occur during manufacture. However, the virus of epidemic keratoconjunctivitis has contaminated solutions of tetracaine hydrochloride and sodium sulfacetamide in physicians' offices after accidental contact of the droppers with patients' secretions during active infection, causing additional cases of the disease. Similarly, viruses of trachoma, herpes simplex, vaccinia, and molluscum contagiosum may conceivably cause drug contamination.

Filtration of previously prepared solutions containing suitable preservatives has proved successful in large pharmaceutical operations for preparing sterile solutions of heat labile drugs. In addition to having bacteriostatic and fungistatic action, a suitable ophthalmic preservative should be nontoxic and nonirritating to ocular tissue, should remain active indefinitely, should not have allergenic or sensitizing tendencies, and should be compatible with other ophthalmic drugs. Chlorobutanol, one of the oldest preservatives, still appears to fulfill best the above requirements.

Sterile, commercially prepared ophthalmic solutions should be dispensed only in their original bottles; they should be available in units of 15 cc. or preferably less. The eye dropper should be sterile and packaged to maintain sterility. The container should be labelled with adequate instructions concerning proper handling.

Preventive and Social Medicine. R. Sand. *British Medical Journal.* No. 4834. p. 471. August 29, 1953.

Although preventive and social medicine are of proven value, they come too little and too late in the curriculum of the medical schools. Hospitals and medical practice emphasize curative medicine, largely neglecting the preventive aspects,

stated Dr. Rene Sand, whose untimely death occurred on August 25, 1953, just as his article went to press. In addition to the usual university premedical curriculum of mathematics, physics, chemistry, and biology, the student should be given courses in psychology and sociology, for these have become indispensable to the physician. Later medical courses should be given with a broadened point of view, including the principles of preventive and social medicine. Clinical studies in the hospital should emphasize the part played by social, economic, and occupational factors.

The goal of medicine should be defined as "the maintenance and culture of physical, mental, and social health, with the repair of damaged health as the second consideration only."

Retrolental Fibroplasia and Prematurity. Medical Forum. J. M. Dixon, W. E. Laupus, E. Wolff, and F. C. Blodi. *Modern Medicine.* Vol. 21. No. 15. p. 118. August 1, 1953.

Comment on the following question was invited from the above authors by the editor of *Modern Medicine:* "Is overloading the circulation with fluids and transfusions the basic cause of retrolental fibroplasia in premature babies?"

Dr. Dixon: The earliest changes in retrolental fibroplasia seen clinically are dilatation and congestion of retinal blood vessels and active proliferation of retinal capillaries within the retina, through the internal limiting membrane, and into the vitreous, as well as proliferation of capillary endothelial cells to form clumps or nests. It is not known whether congestion and dilatation are caused by the growing new vessels or whether the new vessels are the result of congestion which appeared first.

New vessel formation in other conditions indicates that such proliferation is the normal body response in repairing tissue damage from any cause. Thus, any condition causing congestion and dilatation of retinal vessels with damage to the fetal retina of the premature might provoke the response known as retrolental fibroplasia. Transfusions, high electrolyte feedings, anoxia, or sudden changes in blood oxygen content may well be precipitating causes.

Dr. Laupus: The implication of high electrolyte feedings, if confirmed, will justify criticism of the current feeding management for premature infants, reopening the argument between advocates of human milk feedings and those favoring modified cow's milk. Many investigators consider excessive and prolonged use of oxygen to be a more promising etiologic suspect than high electrolyte feedings. Preliminary information indicates that reduced exposure to oxygen may be associated with a more marked reduction in retrolental fibroplasia incidence than is low electrolyte feeding.

Dr. Wolff: The theory of "unbiologic" large intake or injection of electrolytes for prematures as a cause of retrolental fibroplasia sounds convincing. Eye findings give conclusive evidence and the reasoning is logical. The only correct physiologic feeding appears to be mother's milk, a feeding which is low in electrolytes. A systematic storing of breast milk for prematures is needed, as well as research to find cow's milk formulae which are breast milk adaptable.

Dr. Blodi: Although it is assumed that the first change in retrolental fibroplasia is retinal edema, which could be influenced by a low sodium diet, it can be shown that the earliest pathological alteration is proliferation of vascular endothelial cells with gliosis, edema being a secondary complicating feature.

An unpublished survey of 174 infants with retrolental fibroplasia shows that 21 had received only breast milk up to eight weeks of age, and 36 had received breast milk supplemented occasionally with formula. This is in contradiction to the contention that breast milk will prevent the disease. No statistical significance has been found between the number and frequency of blood transfusions given to infants developing retrolental fibroplasia and the number and frequency given to normal infants. Spontaneous changes in incidence have been noted from year to year under identical postnatal conditions. Contrary to the postulate that ACTH may have a beneficial diuretic effect, this hormone apparently is of no value in treating retrolental fibroplasia.

Role of Oxygen in the Genesis of Retrolental Fibroplasia. A Preliminary Report. N. Ashton, B. Ward, and G. Serpell. *British Journal of Ophthalmology.* Vol. XXXVII. p. 513. September 1953.

Since the stage of development of the retinal vessels in kittens at birth is comparable to that of the premature human infant, the kitten was chosen as an ideal experimental animal for studies of retrolental fibroplasia. The effects of high, moderate, and low concentrations of oxygen on the process of retinal vascularization in the first three weeks of the kitten's life are under investigation. This report is confined to the effects of high concentrations of oxygen on retinal development and the effects following transfer to ordinary atmospheric conditions.

High concentrations of oxygen (60 to 80 per cent) obliterated developing retinal vessels in the kitten. Mature vessels such as the tunica vasculosa lentis and the hyaloid artery remained normal; the effect seems to be specific for growing vessels. The extent of vascular obliteration is directly proportional to the degree of immaturity of the retinal vessels, the time of exposure to oxygen, and the oxygen concentration.

The irreversible obliteration of the retinal vasculature apparently is due in part to the clotting of trapped blood. On transferring the animal to air, the renewed growth of retinal vessels forms a grossly abnormal cobweblike pattern, undifferentiated into arteries and veins. The periphery of the new network may hemorrhage extensively. Vessel growth recommences from the disc region; blood vessels penetrate into the vitreous, and retinal detachment ensues.

The authors feel that a similar process may take place in premature infants subjected to high oxygen concentrations in nursery incubators.

General Aspects of Strabismus. J. H. Scruggs, Jr. *Texas State Journal of Medicine.* Vol. 49. p. 700. September 1953.

In determining the cause and appropriate treatment for heterotropia, the following should be considered: (1) the time of onset, (2) whether the deviation is constant or intermittent, (3)

whether the amount of deviation is fixed or variable, (4) whether the deviation is monocular or alternating, (5) whether a vertical element is present, (6) whether the deviation is concomitant or paretic.

Treatment in general is in three main categories: glasses, exercises, and surgery. Glasses, given to correct refractive error and/or to correct minor vertical deviations by means of prisms, may encourage fusion by clearing the patient's vision or by eliminating the need for excessive accommodation. If the condition is not helped by glasses alone, exercises may be used to aid in breaking up suppression and abnormal retinal correspondence, and to train convergence. In monocular deviation occlusion of the good eye is used to force use of the worse eye. Usually vision approaches a useful level after a few weeks of constant occlusion, and if no improvement is evident after four weeks, further occlusion is probably useless. Maximum improvement is generally accomplished in two to three months. If the case requires surgery, this should not be delayed after maximum vision is attained. Of all patients treated surgically, roughly 50 per cent achieve fusion; practically all, however, effect cosmetic improvement.

Present State of Corneal Transplantation. L. Daily, Jr., and R. K. Daily. *Texas State Journal of Medicine.* Vol. 49. p. 706. September 1953.

In corneal transplantation healthy human corneal tissue replaces opaque or inflamed cornea. In the case of the former improved vision may be expected, while in the latter vision may not be increased by the operation. In inflammatory conditions excision of the inflamed area may be accomplished by removing only superficial layers of the cornea and replacing with a lamellar corneal transplant. Although lamellar transplantation usually does not produce good vision, it is less hazardous than penetrating transplantation.

The authors cite the studies of Stansbury (*Archives of Ophthalmology*, vol. 42, p. 813, December 1949) who concluded that only 13 per cent of corneal transplantation resulted in improved vision, 35 per cent resulted in poorer vision, and in many cases total blindness ensued. Since then the authors believe that operative techniques and instrumentation have improved the prognosis for good vision. Postoperative complications, particularly glaucoma secondary to adhesion of the iris to the margin of the wound, which formerly threatened to rob all sight, are also considerably less. Such postoperative complications as vascularization, edema of the transplant, and iritis are inhibited by cortisone, which is applied topically to the eye preoperatively and postoperatively.

Convergence Insufficiency. H. M. Burian. *Journal of the Iowa State Medical Society.* Vol. XLIII. p. 380. September 1953.

Convergence insufficiency, the inability or unwillingness of a patient to converge his eyes on a near object, may result from a defect of one, several, or all components of the total act of convergence. In voluntary convergence the individual wills to turn both eyes nasalward. Involuntary convergence falls into the following classifications: *tonic* convergence keeps the eyes properly aligned horizontally, and is represented by the basic tonus of the ocular muscles when looking at a distance; *accommodative* convergence is

coupled with accommodation in near vision; *fusional* convergence maintains fixation on an object approaching the eyes; *proximal* convergence is an excessive convergence which takes place when a patient looks into an instrument such as a stereoscope or major amblyoscope.

Organic convergence insufficiency is caused by an organic lesion within the pathways for convergence. It occurs suddenly due to trauma or disease, is accompanied by other evidence of intracranial disturbances, and does not respond readily to therapy.

Functional convergence insufficiency, on the other hand, is generally influenced by treatment. Age is no factor in its incidence; there is a slight predominance in females; refractive error does not play a significant role. The subjective symptoms are common to all conditions causing eyestrain. The objective signs are as follows: near point is remote and convergence cannot be sustained; the amplitude of convergence is poor; there is a greater exophoria for near than for distance. These signs may or may not all be present in a given patient, depending on the type and degree of defect in the convergence system.

In diagnosing convergence insufficiency the components making up convergence should be investigated individually. Near point of convergence (normal limits seven to nine cm.), accommodation, and fusion should be evaluated. Once the diagnosis is established, treatment directed toward restoration of the convergence function must be instituted. Therapy takes the form of "finger-to-nose" exercises for near point convergence, and exercises with prisms or stereoscopic devices for improving fusion amplitudes.

Oxygen Studies in Retrolental Fibroplasia. II. The Production of the Microscopic Changes of Retrolental Fibroplasia in Experimental Animals. A. Patz, A. Eastham, D. H. Higginbotham, and T. Kleh. *American Journal of Ophthalmology.* Vol. 36. p. 1511. November 1953.

Ocular lesions closely resembling those of human retrolental fibroplasia have resulted from exposing newborn rats, mice, kittens, and puppies to 70–80 per cent oxygen concentrations for varying periods of time. The results of these experiments support the findings in earlier studies in the authors' premature nursery, in which prolonged oxygen therapy was implicated as an important factor in the etiology of retrolental fibroplasia.

The authors believe that the following recommendations are justified: rigid curtailment of oxygen therapy in the nursery, compatible with the premature infant's physical status; an accurate oxygen analyzer as standard equipment in every premature nursery; taking frequent samplings of oxygen tension when oxygen is administered; specific orders for oxygen therapy except in emergency; ordering oxygen by concentration rather than by flow rate.

Retinopathy of Prematurity (Retrolental Fibroplasia) and its Relationship to Oxygen. R. Bedrossian. *A.M.A. Archives of Ophthalmology.* Vol. 50. p. 266. August 1953.

The term "retinopathy of prematurity" is preferable to retrolental fibroplasia, since it limits the disease to the condition found in the premature infant. In most cases of retinopathy a retrolental membrane does not develop.

Among 127 premature infants weighing less than four pounds at birth, 44 cases of retinopathy developed. The disease was evident in the great majority of these infants shortly after cessation of oxygen supplements. In 13 infants with rapidly progressing retinopathy improvement was shown within two weeks when they were given oxygen therapy. In 11 of these the disease recurred when oxygen therapy was discontinued. The group with retinopathy had received oxygen for a longer time and had a more rapid weaning from oxygen than the group without retinopathy. Two infants developed retinopathy during the course of pneumonia; this subsided when the pneumonia resolved.

Telescopic Spectacles. A Neglected Refinement of Refraction for Cases of Subnormal Vision. H. L. Birge and L. W. Zimmerman. *Connecticut State Medical Journal.* Vol. XVII. p. 985. December 1953.

Telescopic and microscopic spectacles may be applied as an aid to subnormal vision whenever visual acuity ranges between light perception and 20/70. Both the patient and the profession of ophthalmology have suffered because the possibilities of such magnifying lenses have not been utilized sufficiently. Telescopic lenses magnify the image and bring objects apparently closer, so that less sensitive retinal cells can discern small objects. The following groups of cases may benefit from telescopic spectacles:

Postoperative brain tumor cases with permanently impaired vision; inoperable cataracts that seriously impair vision; advanced arrested glaucoma; extensive myopia; and aphakic eyes with defects that reduce acuity.

Telescopic spectacles may also be of value in cases of advanced optic atrophy; advanced diabetic retinitis; advanced Coates disease; monocular persons with residual retinal damage after detached retina surgery; early retinitis pigmentosa; retrolental fibroplasia; and congenital ocular defects.

Two conditions in which telescopic lenses are not applicable are amblyopia ex anopsia and curable ophthalmopathies.

The technique of fitting such lenses is outlined. Patients must be educated to the use of telescopic spectacles. The adjustment required of an aphakic patient is negligible compared to that of a person learning to use telescopic lenses.

Six case reports are furnished to illustrate the use of such lenses in patients with visual defects from different causes.

Vitamin B_{12} Excretion and Diabetic Retinopathy. B. Becker, C. A. Lang, and B. F. Chow. *Journal of Clinical Nutrition.* Vol. 1. p. 417. September–October 1953.

The increasing evidence that vitamin B_{12} plays a role in carbohydrate metabolism, and the fact that when vitamin B_{12} containing radioactive cobalt is administered the pancreas retains a high concentration of radioactivity, led the authors to investigate the urinary excretion of vitamin B_{12} by diabetic patients. The patients used in the study were divided into three groups: diabetic with retinopathy, diabetic without retinopathy, and normal control subjects. All patients were given a single intramuscular injection of 50 or 60 micrograms of vitamin B_{12}. Insulin therapy was not interrupted. Microbiological estima-

tion of vitamin B_{12} in the urine eight hours after administration revealed that diabetics without retinopathy excreted much less vitamin B_{12} than the controls, and diabetics with retinopathy excreted considerably more than the nondiabetic controls.

Since testosterone has been used in managing diabetics with retinopathy, the effect of this hormone on the excretion of vitamin B_{12} was studied in 11 such patients. In every case there was a marked decrease in vitamin B_{12} excretion.

Studies were made of urinary vitamin B_{12} excretion of 12 female adult rats injected every third day with cortisone, testosterone, or saline solution, followed after two weeks by injection of a test dose of one microgram of radioactive vitamin B_{12}. Vitamin B_{12} activity in 24-hour urine specimens of cortisone-treated animals was almost twice that of control (saline-injected) animals, while urine specimens from the testosterone-injected animals showed no difference from the controls. Tissue analyses (muscle, liver, and kidney) showed that the cortisone-treated animals, and to some extent the testosterone-treated animals, retained less radioactivity than the controls.

Contamination of Eye Medications: Practical Methods of Prevention. J. H. King, Jr. *American Journal of Ophthalmology*. Vol. 36. p. 1389. October 1953.

Contamination of eye medications probably never occurs in the operating room, but the ward dressing tray, the clinic, and the private office are often the sites of unsterile medications. The usual cause is a contaminated eye dropper which has touched an infected eye. *Pseudomonas aeruginosa*, a bacterium that can survive in many disinfectant fluids in high concentrations, is a common contaminating organism; it can grow in practically any ophthalmic solution including antibiotics, and causes a variety of serious ocular infections. Epidemic keratoconjunctivitis has also been spread by solutions accidentally contaminated in clinics and physicians' offices. To insure sterility every ophthalmologist should investigate the pharmacy making his solutions.

Solutions may be kept sterile by using small sterile refillable containers, disposable sterile containers, sterile dried fluorescein in wafer form, and disposable plastic eye droppers.

The collapsible metal tubes and their caps, used to package ophthalmic ointments, can be sterilized. Their contents, however, are not stable in heat sterilization, and the addition of preservatives is necessary. In most cases new unused tubes are not contaminated. Contamination of ointment occurs most often in touching the tip of the tube to the patient's eye. Containers with an extension of disposable polyethylene tubing at the tip are recommended. Contamination is avoided by cutting off the end of the tube with sterile scissors and capping the container. Many sterile applications can thus be obtained from a single tube.

The ideal eye ointment would be packaged in small sterile tubes containing one application; however, the expense is prohibitive. A slightly larger container, holding about one sixteenth of an ounce, equipped with an extension tube, is a desirable alternative. For applying ophthalmic ointments a disposable sterile paper rod is

good. Plastic containers for ointments would be desirable, but this is not possible at present because of the chemical and physical properties of most plastics.

Retrolental Fibroplasia and Related Ocular Diseases. Classification, Etiology, and Prophylaxis. T. S. Szewczyk. *American Journal of Ophthalmology.* Vol. 36. p. 1336. October 1953.

After reviewing the literature on retrolental fibroplasia and its relation to oxygen, the author concludes that the condition is one of the terminal phases of uncompensated retinal hypoxia. He feels that premature infants kept in an atmosphere enriched with oxygen become acclimatized to it, and when transferred too suddenly to a normal atmosphere, develop hypoxic retinopathy.

Supplementary oxygen should be administered only when needed, and then in concentrations just sufficient to overcome any existing deficiency. The majority of premature infants will thrive in a normal atmosphere. When oxygen is used for a prolonged period, the author recommends that weaning from the enriched atmosphere be done in gradual stages to prevent funduscopic changes.

A Simple Method for Sterilizing the Tonometer. P. Tower. *A.M.A. Archives of Ophthalmology.* Vol. 50. p. 512. October 1953.

Since the determination of intraocular pressure is now recognized as an essential part of routine ophthalmologic examination, the tonometer might be used in testing patients with acute conjunctivitis, dacrocystitis, syphilis, gonorrhea, or tuberculosis. To prevent the instrument from becoming a carrier of infection, a reliable method of sterilization is important.

Ether and alcohol are not efficient as bactericidal agents. Zephiran's germicidal properties are limited, and when used in sufficient strength this substance may damage the cornea. Boiling is the only thoroughly reliable way of sterilizing the instrument. Only the portion below the side arms, consisting of plunger, foot plate, and handle sleeve holder, which may come in contact with the patient's eye, need be boiled. Distilled water is preferable to tap water for sterilization. Any small sterilizer can be adapted, but the author has used a modification of the Renwal sterilizer, which has a hole in the lid. Boiling is continued for at least five minutes; longer boiling is not necessary but can do no harm. Upon removal from the sterilizer the foot is wiped with tissue or gauze; after withdrawing the plunger a pipe cleaner is run through the cylinder. The tonometer is then reassembled and ready for use.

Simulated Progression of Visual Field Defects of Glaucoma. R. M. Day and H. G. Scheie. *A.M.A. Archives of Ophthalmology.* Vol. 50. p. 418. October 1953.

Ocular conditions such as changes in the transparency of the ocular media, refractive disturbances, and miosis diminish the amount of light falling upon the retina, simulating progression of the visual field defects of glaucoma. These factors, therefore, may result in erroneous conclusions. Since progressive enlargement of visual field defects serves as the most dependable indication for surgical intervention in glaucoma, the consideration of other

factors which apparently impair the visual field is of great importance.

Both miosis and artificial myopia were found to produce changes in the central visual field in two normal subjects with nonpresbyopic eyes; these changes were more marked when the two factors acted simultaneously. Miosis produced a significant reduction of the visual field in two presbyopic patients. Two patients tested with frosted lenses demonstrated concentric contraction of the visual fields and enlargement of the physiologic blind spots. An apparent constriction of the central visual fields in a patient with a nuclear cataract disappeared after removal of the cataract.

Similar studies were undertaken on glaucomatous eyes. Ciliary spasm in a nonpresbyopic patient with simple glaucoma after treatment with miotics caused apparent deterioration of the visual field. In a glaucoma patient tested with frosted lenses the central visual field contracted markedly. Tests in two additional glaucoma patients with cataractous changes showed that the combination of pupillary constriction and cataractous changes can cause marked visual field alterations which may accentuate those caused by chronic simple glaucoma. Three glaucoma patients, after undergoing cataract extraction, had improved visual fields.

Visual fields in nonpresbyopic glaucoma patients should be determined only after any accommodative spasm induced by miosis has subsided. The pupils should be of the same size during each visual field charting. In visual field measurements the status of the optical media should be carefully evaluated, to avoid unwarranted surgery indicated by an apparent loss of field.

Age Distribution of the Onset of Esotropia. W. Nordlöw. *British Journal of Ophthalmology.* Vol. 37. p. 593. October 1953.

Information concerning the age distribution of the onset of esotropia is of value in discussing the etiology of strabismus. During a 10-year period 403 cases of permanent squint and 82 cases of intermittent squint were studied. All were examined within seven years after development of the condition.

In permanent esotropia, 36.3 per cent developed the squint during the first six months of life, 53 per cent during the first year, 21.1 per cent during the second year, 14.4 per cent during the third year, 6.3 per cent during the fourth year, 3.3 per cent during the fifth year, and the remainder during the sixth and seventh years of life.

In 84 per cent of the cases of intermittent squint the onset occurred during the first five years of life, in approximately equal numbers each year. There was a tendency to preponderance between three and four years of age. The intermittent squints occurring in the first five years of life comprised 6.5 per cent, 12.3 per cent, 20.4 per cent, 46.8 per cent, and 55 per cent of the total squints for those ages, respectively. The older the child at the onset of squint, the greater the likelihood it is the intermittent type.

Cyanopsin, a New Pigment of Cone Vision. G. Wald, P. K. Brown, and P. H. Smith. *Science.* Vol. 118. p. 505. October 30, 1953.

Two retinenes (derivatives of vitamin A) and two opsins (visual proteins) are known to form visual pig-

ments. Three such pigments had been demonstrated previously: retinene$_1$ and scotopsin (rod opsin) combine forming rhodopsin; retinene$_1$ and photopsin (cone opsin) combine to form iodopsin; retinene$_2$ combines with scotopsin to form porphyropsin. A fourth pigment, called cyanopsin, has now been prepared by the combination of retinene$_2$ and photopsin. This blue photosensitive substance has an absorption maximum at 620 mμ.

To synthesize cyanopsin an extract of dark adapted rods and cones from chicken retina, containing rhodopsin and iodopsin, is exposed to deep red light. The iodopsin is bleached irreversibly, yielding all-trans retinene$_1$ and photopsin, while the rhodopsin remains intact. A specific *cis*-isomer of retinene$_2$ is added, and combination with photopsin takes place forming cyanopsin. The synthesis is completed within five minutes in the dark at room temperature. In red light cyanopsin bleaches to a straw colored mixture of all-trans retinene$_2$ and photopsin.

Extraction of this pigment from retina has not been accomplished to date. However, cyanopsin would be expected to occur in any retina which contains vitamin A$_2$ or retinene$_2$ and photopsin. Fresh water fish retinas have these substances and it has been shown that in one fresh water fish the maximal spectral sensitivity of cone vision is near 620 mμ, resembling closely the absorption spectrum of cyanopsin. Similar results have been obtained in several turtles. Cyanopsin is concluded to be a pigment of cone vision in these animals. It extends the range of visual pigments far into the red and may play a part in color vision in some animals.

Aureomycin, Chloramphenicol and Terramycin in Ophthalmology.

A. Sorsby, J. Ungar, and R. P. Crick. *British Medical Journal.* No. 4831. p. 301. August 8, 1953.

Although the use of penicillin, the sulfonamides, and streptomycin in infections due to certain bacterial organisms is well established, none of these agents has been effective against virus infections. The exceptions are the value of sulfonamides in trachoma and the response of inclusion blennorrhea to penicillin as well as sulfonamides. The newer antibiotics offer the possibility of success in combating such viral affections as dendritic ulcer, disciform keratitis, epidemic keratoconjunctivitis, and herpes ophthalmicus.

Aureomycin, chloramphenicol, and terramycin administered systemically do not penetrate readily into the eye. Of the three agents, only chloramphenicol can be given subconjunctivally in a relatively high concentration; the other two are less soluble, and in suspensions of substantial concentrations, marked irritative reactions are produced.

Symptomatic relief in five cases of epidemic keratoconjunctivitis was obtained with aureomycin ointment 1 per cent, but there was no effect on the superficial corneal staining. Five cases responded well to treatment with terramycin ointment 0.5 per cent; clearing up within two to seven days. Drops of 0.5 per cent chloramphenicol or 1 per cent chloramphenicol ointment used in 26 cases of epidemic keratoconjunctivitis gave good results. Repeated subconjunctival injection of 15 per cent chloramphenicol suspension resulted in improvement of

a postoperative ocular infection caused by a pneumococcus insensitive to penicillin and sulfonamides.

Radiation Cataract. W. T. Ham, Jr. *A.M.A. Archives of Ophthalmology.* Vol. 50. p. 618. November 1953.

Radiation cataract was manifested in 1948 by at least five nuclear scientists of an average age of 31, who had been exposed to radiation from the cyclotron. Further investigation among cyclotron workers disclosed six additional cases. Radiation cataract was discovered in well over 100 survivors of the atom bombings at Hiroshima and Nagasaki. Reexamination of 70 of these victims six years later revealed moderate regression of opacities in two per cent, slight regression in 17 per cent, no change in 36 per cent, slight progression in 15 per cent, moderate progression in 26 per cent, and marked progression in four per cent. Reports of the current status of cataract victims in Japan indicate that very few have visual impairment resulting from exposure to the bomb. Accidental nuclear reactions occurred in 1945 and 1946 at Los Alamos Scientific Laboratory, injuring 10 scientists and resulting in radiation cataracts in two of the survivors. Gamma-rays and fast-neutrons were responsible for the biological damage.

The cataractous dose of X-rays or gamma-rays, based on clinical data in patients receiving radiation therapy to the head, is estimated to be between several hundred and several thousand roentgens. Further investigation of available clinical data is needed. The author regards 500 roentgens of X-rays or gamma-rays as potentially dangerous to the human lens. Animal studies as well as the unfortunate experiences of the cyclotron victims indicate the probability that fast-neutrons are 10 to 20 times as effective in producing cataract as X-rays.

The Committee on Radiation Cataracts, which met in Washington in 1950, stated among its objectives the stimulation of research on radiation dosimetry and the encouragement of comparisons among different laboratories to determine the biological effects of ionizing radiations in terms of a common denominator. Several instruments have been designed since then to measure mixed radiation doses, and it is possible now to measure accurately and separately the fast-neutron and gamma-ray dose so that the relative biological effects of each component may be evaluated.

Visual Factors in Reading: With Implications for Teaching. H. L. Hulsman. *American Journal of Ophthalmology.* Vol. 36. p. 1577. November 1953.

A mentally capable child's inability to read may be caused by inadequate teaching, absence during critical lessons, emotional disturbance, or in the absence of these factors, the reason for failure to learn may be physical. However, the child's health may seem good and his eye test may show good vision at a distance of 20 feet. His eyes, nevertheless, may be bothering him, for the school test does not always detect the visual difficulty.

Hypermetropia and exophoria at reading distance seem to be the most common eye defects among the poor readers. Aniseikonia has a significant effect on reading ability, but its incidence is not so high. In these studies astigmatism did not show an important relationship to reading. Myopia

did not affect reading skill at the usual reading distance, but would affect reading from the blackboard. The frequency of visual defects among poor readers enhances the probability that they are significant factors in the reading disability.

The Sensitivity of the Cornea and Conjunctiva of the Human Eye and the Use of Contact Lenses. H. Strughold. *American Journal of Optometry and Archives of the American Academy of Optometry.* Vol. 30. p. 625. December 1953.

Since contact lenses produce discomfort after several hours of use, the sensitivity of the cornea and conjunctiva and their responses to mechanical stimuli should be considered in the design, construction and fitting of contact lenses. Unlike the skin, the cornea and conjunctiva show only one type of sensation due to mechanical stimuli. It begins only after a latent period of a fraction of a second to more than one second; its intensity increases, abates, and may increase again; it is felt as a disagreeable itching, is poorly localized, and is classified as a pain sensation.

The pain threshold varies considerably for different regions of the eyeball. Thresholds were determined for 55 different points on the eye. The lowest threshold (0.2 grams per mm.^{2}) is at the center of the cornea. Toward the corneo-conjunctival margin it rises to two grams per mm.^{2}. After transition to the conjunctiva the threshold increases suddenly to about 30 grams per mm.^{2}, and then falls to about 15 grams per mm.^{2} near the palpebral margin.

The high threshold of the conjunctival region near the cornea is of interest in relation to contact lenses. The sensitivity of this area is about 0.006 that of the center of the cornea, corresponding approximately to the pain sensitivity of the skin of the lower arm.

The palpebral margin and the marginal area of the conjunctiva tarsalis show a touch or pressure sensation in response to mechanical stimuli, which is felt as a tickle and is sharply localized. There is no noticeable latent period. The thresholds correspond approximately to those of the pressure sense on the skin of the lower arm. These areas are also sensitive to pain.

Wearers of contact lenses report that if a lens moves out of place they cannot determine the direction of the displacement. This supports the findings that pressure sense is absent in these regions.

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Bactericidal and Fungicidal Effects of Ozone on Deliberately Contaminated 3-D Viewers. L. J. Warshaw. *American Journal of Public Health.* Vol. 43. p. 1558. December 1953.

Because of the relatively high cost of the polarizing spectacles which must be worn by viewers of three dimensional motion pictures, some theaters have been collecting the spectacles from people leaving the theater and reissuing them to new patrons. The fear was expressed that skin, scalp, and eye infections may be spread from one person to another in this way, and therefore an effective means was sought of decontaminating the spectacles. The author, who is medical director of Paramount Pictures Corporation, New York, reported an

investigation of the effectiveness of ozone as a means of destroying organisms with which 3-D spectacles had been deliberately contaminated.

Exposure to an ozone atmosphere of 200 parts per million for 30 minutes was reported to be a satisfactory method of decontaminating the spectacles. Exposure to many times the above concentration of ozone did not affect the optical quality of the polarizing lenses.

Ultraviolet Radiation and Vision. J. C. Ogilvie. *A.M.A. Archives of Ophthalmology*. Vol. 50. p. 748. December 1953.

Although it has been suggested that ultraviolet radiation, between 300 and 400 mμ, can have a harmful effect on vision, extensive experiments have shown that abiotic effects can be obtained only with wave lengths of less than 305 mμ. The minimal exposure necessary to produce corneal damage is 2×10^6 erg-seconds per square centimeter. The cornea and lens absorb these wave lengths strongly, and thus, 19 times the above exposure would be required to affect the lens—even 150 times this amount would affect the lens to a depth of only 20 μ. Therefore, the abiotic ultraviolet radiation from normal use of any artificial light source was found to be incapable of causing retinal damage.

Studies in which it was suggested that wave lengths below 400 mμ impair dark adaptation have been criticized on the basis that absorption of ultraviolet rays by the cornea and lens does not permit ultraviolet penetration to the retina. Effects have been found only on aphakic subjects. In the earlier work adaptation may have been affected by the total brightness of the unfiltered ultraviolet ray source.

Fluorescence of the cornea is excited by exposure to ultraviolet light of wave lengths from 315 to 360 mμ. Fluorescence of the lens is far more intense and is produced by wave lengths from 300 to 400 mμ, the most effective wave lengths being between 360 and 370 mμ. The intensity of fluorescence increases with age and varies with the seasons, being higher in summer than in winter. Virtually nothing is known of the effects of fluorescence on visual function.

Most reports on color sensation elicited by ultraviolet light state that a gray-blue is perceived, becoming grayer as the wave length of the rays decreased and bluer with increasing wave length. As the wave length approaches 400 mμ, the sensation is violet.

Observations on the Etiology of Retrolental Fibroplasia. H. H. Gordon, L. Lubchenco, and I. Hix. *Bulletin of the Johns Hopkins Hospital.* Vol. 94. p. 33. January 1954.

The incidence of retrolental fibroplasia in 211 premature infants weighing less than 1,500 grams at birth was studied in relation to oxygen administration at the Colorado General Hospital in Denver. The infants were divided into four chronological periods.

During period I, 34 months, 80 infants received moderate amounts of oxygen. Residual lesions were observed in 12 infants (15 per cent) and retrolental membranes were found in eight (10 per cent).

During period II, five months, 20 infants received high concentrations of oxygen (60 per cent or more). Nine infants (45 per cent) had residual lesions and seven (35 per cent) had retrolental membranes.

In period III, three months, oxygen administration to 14 infants was gradually decreased to 30–40 per cent. During this transition period four infants (29 per cent) developed residual lesions, and in three (21 per cent) there were retrolental membranes.

In period IV, 24 months, the concentration of oxygen administered to 97 infants was limited to 30–40 per cent, and the duration of oxygen therapy was also decreased. Eight of these infants (eight per cent) had residual lesions and two infants (two per cent) had retrolental membranes.

The restriction of oxygen led to a marked drop in the incidence of retrolental fibroplasia over a two-year period. Survival rates were not adversely affected by the decreased oxygen concentrations. The difference in incidence of retrolental fibroplasia between period II (high oxygen therapy) and period IV (low oxygen therapy) is highly significant statistically.

Retrolental fibroplasia is a disease in which high environmental oxygen is a most important etiologic factor. However, the condition of the capillaries at birth, the rate of growth, or dietary components such as electrolytes or tocopherol are factors which may also play roles in the etiology of the disease.

Retrolental Fibroplasia. Definitive Role of Oxygen Administration in Its Etiology. J. C. Locke. *A.M.A. Archives of Ophthalmology.* Vol. 51. p. 73. January 1954.

The incidence of retrolental fibroplasia and the duration of continuous oxygen therapy were correlated in a comparative study of 327 premature infants. Acute manifestations of the disease were observed in 1951 in 60 of 160 babies at Lincoln and Presbyterian Hospitals in New York who received prolonged oxygen therapy. Oxygen withdrawal was always gradual rather than sudden.

From February to July 1952, at Royal Victoria and Catherine Booth Mothers' Hospitals in Montreal, 43 premature infants were observed. Six developed retrolental fibroplasia. During this period, although there was no effort to limit the amount of oxygen administered to the infants, they received less than the New York group. If the disease had occurred at the same rate as in the 1951 group, 10.5 cases would have been found.

From August 1952 to October 1953 only two cases were found among 124 premature infants in Montreal. During this period minimal amounts of oxygen were given. In most cases the oxygen supplements were just sufficient to prevent cyanosis. If the incidence of retrolental fibroplasia had been similar to the New York group, 32.5 cases would have occurred. The two observed cases in this last group developed only mild forms of the disease. These infants weighed 2½ to 1¾ pounds at birth and received relatively larger amounts of oxygen (18 and 28 days, respectively) than others in the same birth weight group. In both infants the disease regressed completely to normal.

On the whole, the babies who developed retrolental fibroplasia received oxygen for significantly longer periods than those who did not. No explanation could be found for the decreased incidence of retrolental fibroplasia, other than the reduction of the amount of supplemental oxygen.

The author concludes that "the disease would seem to be directly related to hyperoxia, rather than to any secondary anoxia induced by oxygen withdrawal. Whether rapid removal from high oxygen can *increase* the tendency toward retrolental fibroplasia cannot be deduced from this study."

Ocular Manifestations of Migraine: Report of Four Cases of Hemianopsia. R. W. Hollenhorst. *Proceedings of the Staff Meetings of the Mayo Clinic.* Vol. 28. p. 686. December 2, 1953.

Although hardly any two patients with migrainous headaches report identical visual manifestations, the pattern of these attacks is often so similar that ordinarily a diagnosis can be made with little difficulty, based on the history alone. The sequence of events in migraine may be described as a "periodic recurrence of violent, usually unilateral, head pain preceded by auras in the shape of visual malfunction, usually so-called teichopsia or scintillating scotoma, and partial blindness accompanied by nausea and vomiting and followed by exhaustion and sleep." This entire syndrome probably occurs in about 10 per cent of patients, the remainder having variations. The aurae, which usually appear in the side opposite to the site of the headache, generally last for 10 to 30 minutes, but may persist for several hours.

Four cases are reported in which permanent visual defects resulted from what appeared to be severe migrainous attacks. Sudden intracranial occlusion probably caused the visual defects in these cases. If these visual disturbances represent part of the angiospastic portion of the migrainous sequence, then this study would tend to substantiate the current theories of the course of migraine.

Intelligence Tests for Visually Handicapped Children. G. Scholl. *Exceptional Children.* Vol. 20. p. 116. December 1953.

After the publication of the Wechsler Intelligence Scale for Children it was recommended that this test be used for blind children under 10 years of age. The test was administered to 23 children (16 boys and seven girls) between seven and 14 years of age who were enrolled at the Michigan School for the Blind. All 12 tests were administered to the 14 partially seeing students, while the six tests comprising the verbal series were given to the nine totally blind students.

The performance series was administered in the best lighting environment possible. The picture completion test seemed to give the students no difficulty, as the pictures are clear and well defined. Large black pencils were used in these tests.

The IQ range in the verbal series was from 82 to 115 for the nine totally blind children, with a median of 94. The verbal IQ for the 14 partially seeing children ranged from 65 to 120, with a median of 88; the performance IQ in this group was from 64 to 124 (median 86). Five partially seeing children did better on the performance test than on the verbal, due to motivational or psychological factors. Most of the others did better on the verbal tests because of their poor vision.

The author's experience indicates that the Wechsler Intelligence Scale for Children is adaptable to blind and partially seeing children.

Bulbar Pressure Test in Glaucoma. P. L. Blaxter. *British Journal of Ophthalmology*. Vol. 37. p. 641. November 1953.

This relatively simple massage test, devised to estimate facility of aqueous outflow from an eye while external pressure is applied to the globe, is of value in investigating glaucoma cases. Massage tests in general are based on prolonged application of pressure to the globe, resulting in an initial rise in intraocular tension depending on the degree of compression, the elasticity of the sclera, and the initial tension of the eye; and if compression is maintained the tension falls gradually because aqueous is continually forced out of the eye more rapidly than it is formed. It is possible that in addition to the latter factor the application of external pressure depresses the rate of formation of aqueous, thus increasing the fall in intraocular pressure.

The principle of the bulbar pressure test depends on the fact that the change in intraocular pressure at the time that an eye is compressed gives information from which a figure called the *outflow fraction* (O.F.) can be calculated. The O.F. is directly dependent on the change of aqueous volume, and differs significantly in eyes in which aqueous outflow is restricted. In order to record changes while the eye is being compressed rather than after the compression is removed, two instruments must be used: a Schiøtz X tonometer (weightless) and a dynamometer to apply the additional compression required.

To perform the test on the right eye, the tonometer is applied to the center of the cornea with the left hand and the first reading (A) is taken. The Bailliart dynamometer, held in the right hand, is applied with a pressure of 50 grams to the lateral side of the globe, and after 10–15 seconds reading B is taken. Four minutes later reading C is taken and the dynamometer is then removed to give reading D. The difference between readings B and C represents the outflow of aqueous. The O.F. is equal to $\frac{B-C\ (100).}{B}$

The results of clinical studies indicate that the bulbar pressure test is of value in the early diagnosis of chronic simple glaucoma, but is apt to be misleading in congestive glaucoma. The test may be used in investigating the success of filtering operations. When combined with tonography the test enables the examiner to determine the necessity for surgery. The results obtained in chronic simple glaucoma suggest that obstructed aqueous outflow is the main factor in the disease, and, further, that the obstruction has two components: one permanent, anatomical and sclerotic, and the other variable and vascular in origin.

Hyperopia in School Children: Its Detection With a Plus Sphere Lens and Its Significance in Reading. L. Johnson. *Journal of School Health*. Vol. XXIII. p. 268. November 1953.

The Massachusetts Department of Public Health has stated that when young children are tested with a plus 1.75 diopter spherical lens and older children with a plus 1.50 lens, about seven per cent of all school children will test farsighted. In Oakland, California, it was decided to screen with a plus 1.75 lens in addition to the Snellen test. In no age group did the author find as many as seven per cent testing hyperopic, the average being 1.5 per cent.

Since a child with up to two or three diopters of hyperopia may go without correction unless there are symptoms of visual impairment or fatigue, there is some justification for not using a plus sphere lens, especially if each child is questioned to determine symptoms of eyestrain or visual impairment.

In general the findings in this study support the theory that as the eyeball grows hyperopia will decrease. Among older children a decreasing percentage of hyperopia was found.

Biochemical Changes in Preserved Corneal Tissue. F. Redi. and M. Miglior. *Rass Ital. d'Ottal.* Vol. XXI. p. 445. November–December 1952.

Little is known of the changes which develop in the cornea preserved for only a few days before transplantation, and that which is recorded is mostly histological data. The author's studies are concerned chiefly with the ozo-protein content but were not sufficiently conclusive to be of great value. It was clear that corneal tissue is best preserved when isolated from the globe and in conditions where there is the least modification of the aqueous-like fluid. Hydrization favors the disintegration of the protein scaffold and the autolysis of the protein itself.

EUGENE M. BLAKE, M.D.

OXYGEN LIMITED

In an effort to reduce the incidence of retrolental fibroplasia the following letter, prepared by the Central Committee in Ophthalmology for the Royal College of Physicians and Surgeons of Canada and the Canadian Ophthalmological Society, was sent to all certified ophthalmologists in Canada:

"The Central Committee in Ophthalmology asks your cooperation in cutting down the incidence of retrolental fibroplasia.

"Having weighed the evidence, the Committee now feels justified in recommending that all premature babies should receive the least possible quantity of oxygen (just enough to prevent cyanosis). At the discretion of the paediatrician, the concentration of oxygen, as soon as possible, should be gradually reduced.

"While investigation is still going on, your co-operation and reports in dealing with this serious condition will advance our knowledge so that early discussion may lead to general agreement."

DANGER IN EYE GLAMOUR

Some years ago the unrestricted use in eyelash and eyebrow cosmetics of synthetic materials intended originally as fur dyes resulted in at least one case of permanent blindness, and many others of severe eye injury. These reactions influenced the inclusion of cosmetics in the Food, Drug and Cosmetics Act of 1938.

Veronica L. Conley of the American Medical Association Committee on Cosmetics warned in the February issue of *Today's Health*, "The best advice you can follow about their use (eyelash dyes) is—Don't! your eyes are too precious to take chances with." Miss Conley's article was provoked by a famous foreign actress's recommendation of a mixture of boot polish and cold cream as mascara. Shoe creams, formulated with turpentine oil as a solvent, are certainly not suited for use in, on, or near the sensitive eye. In this country one beauty writer suggested that the small fibers of velvet ribbon could be mixed with mascara with a wet brush—presumably to produce "velvety" eyelashes.

Mascara preparations claiming to produce "permanent" color are made from dyes and should be avoided.

BOOKS AND PAMPHLETS

School Health Services. Charles C. Wilson, M.D., Editor. National Education Association and the American Medical Association. National Education Association, Washington, D. C. 1953. 486 p. $5.00.

This book is a report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, with the cooperation of many contributors. It will undoubtedly serve as a text of great value in health education courses all over the United States because it represents the up-to-date philosophy with regard to the various aspects of health services in the schools.

Among the chapters of particular interest to those concerned with sight conservation are those on appraising visual status, school sanitation, and adjusting programs to individual needs. The book notes that the cooperative type of placement of the partially seeing child is to be preferred to that in a special school or to segregation in a special class. The recently developed kind of cooperative plan in which the child is retained full time in the regular classroom also is noted.

In discussing screening tests for visual acuity emphasis is placed on the fact that these tests do not diagnose the nature of eye defects. The book urges that children with signs or symptoms of eye disorder be referred for a thorough eye examination, along with those who are referred on the basis of a screening procedure.

So much progress has been made in recent years in the broad field of school health that this book will be of considerable interest to all those who are active in any aspect of the problem.

Physiology of the Eye. Second edition. Francis Heed Adler, M.D. C. V. Mosby Company, St. Louis. 1953. 634 p. $13.00.

In this revised edition of Adler's classic and outstanding work a great deal of new material has been included, with new illustrations. Morton Grant's recent studies of aqueous flow are discussed, as well as those by Goldmann and Baranay. In discussing corneal turgescence and transparency, reference is made to the newer studies of Maurice and Giardini and of Smelser and Ozanics. The chapter on ocular motility has been expanded in the light of the AAOO symposium on strabismus. In discussing the vitreous the studies of Grignolo with the phase microscope are noted, indicating that the vitreous is not a structureless gel but possesses ramifying fibrous elements of various widths.

Much of the chapter on visual acuity has been rewritten, and is naturally of deep interest to all in the field of eye care and eye health.

The author's lucid style and scholarly approach should make this book a must on the shelf of anyone in the field of vision.

Glaucoma—Pathology and Therapy. Paul Weinstein, M.D. Translated by Julius Foldes, M.D. C. V. Mosby Company, St. Louis. 1953. 296 p. $8.00.

In the foreword to this text Dr. Derrick Vail expresses gratitude for a work on glaucoma that represents a complete review of the subject by so eminent a scientist as Dr. Weinstein. Such a task, Dr. Vail points out, requires wide experience, a rare knowledge of many languages and superb judgment. The translation from the Hungarian language by Dr. Foldes brings to the majority of American ophthalmologists material that would otherwise be unavailable.

Following a brief chapter on the history of glaucoma Dr. Weinstein discusses the diagnosis, clinical classification and frequency of the disease; physiology and pathology of ocular tension; etiology and therapy.

The text includes complete references to glaucoma literature that appeared between 1930 and 1950.

School Nursing in the Community Program. Marie Swanson, R.N. The Macmillan Company, New York. 1953. $5.00.

A substantial section of this text is devoted to eye health. The author emphasizes the importance of vision screening in the first school year, rather than waiting until children might be more easily screened two or three years later. She also stresses the value of teacher alertness in observing signs of eye trouble in children. Proper classroom seating and lighting are indicated as problems that should receive major attention.

Miss Swanson refers frequently to the services of the National Society for the Prevention of Blindness. While some of the suggestions are slight deviations from the Society's recommendations, this text should serve to sharpen a school nurse's awareness concerning a total health program of which eye health is an integral part.

Although the reader might gain the impression that more vision screening assistance is given where there is a liberal amount of nursing service, Miss Swanson has urged adherence to the recommendations of the Joint Committee on School Health. This Committee encourages the teacher to screen at a time when it can be most meaningful to the child. The National Society concurs that the trend is away from the nurse's screening but does urge that she assist the teacher as indicated.

There is reference to the adverse emotional effects of strabismus, but not to the fact that early correction is imperative to avoid visual loss through suppression of one eye.

Miss Swanson has visualized the school nurse's role realistically and pointed out constructively the variations in concepts and practices.

Distribution of Health Services in the Structure of State Government. Public Health Service Publication 184, Part 3, pp. 119–277. 1950. U. S. Government Printing Office, Washington, D. C. 65 cents.

Among the health and disease control services discussed and tabulated in this extensive report is the prevention and treatment of blindness. The marked increase during the past decade of state government participation in programs to prevent blindness and restore vision is elaborated. Examination and hospital treatment are pro-

vided by most states for eligible persons. Free examinations to establish extent of blindness are provided in nearly every state.

State-owned institutions in 29 states provide eye care. These include hospitals operated by 18 state universities, one welfare department, two boards of control, three health departments, and one independent state hospital board. Hospitals operated by the health departments of Kentucky and Missouri accept trachoma cases only. In the remaining 29 states where hospitalization is provided, care is purchased by welfare departments, special commissions, departments of education, health departments, and boards of control. Diagnostic and treatment services in clinics are available to medically indigent persons in about half of the states in general eye clinics or in clinics organized for refraction, glaucoma, or trachoma only.

The Causes of Blindness in England, 1948–1950. Arnold Sorsby. Her Majesty's Stationery Office, London. 1953. 41 p. 2 shillings.

This report supplements the previous study by the same author, which was published in 1950 and covered a large sample group of the total register of the blind, but gives a better indication of the causes of blindness which are operating at the present time. Detailed tabulations are presented showing distribution by cause, age and sex. The figures show an increase in blindness among children under five years of age and a steady annual increase in the proportion of the aged among the blind population. Nearly 90 per cent of the blind registering in recent years are 50 years of age or over; over 60 per cent are 70 years or over. The most significant causes of blindness among 18,150 persons registered in the three-year period were: senile cataract 30.4 per cent; senile macular degeneration 15.3 per cent; primary glaucoma 14.0 per cent; myopia 8.9 per cent; congenital anomalies 5.0 per cent.

Revision of Standard Text

Columbia University Press announces for publication in late 1954 the third edition of Winifred Hathaway's standard sourcebook, Education and Health of the Partially Seeing Child. This text describes ways and means of providing educational facilities suited to partially seeing children and offers plans which enable them to participate as nearly as possible in normal school life. As inclusive and authoritative as the former editions, the third includes new material on recent education programs developed to meet needs in rural areas, on mechanical devices, on long-term guidance. Mrs. Hathaway, now retired, was for many years associate director of the National Society for the Prevention of Blindness.

The price of the revised edition will be about $3.75. Advance orders should be sent directly to Columbia University Press, 2960 Broadway, N. Y. 27.

NEW LARGE TYPE BOOKS

Stanwix House announces that a number of new large type edition books have recently been released and that others are in preparation. Educators concerned with the education of the partially seeing student may be interested in writing to this publisher at 3020 Chartiers Avenue, Pittsburgh 4, for the current catalogue. The publication of new materials for use in the secondary school is of particular interest.